School of Technology

ANNOUNCEMENTS 1973-74

PURDUE UNIVERSITY BULLETIN

University Calendar

1973

SEPTEMBER

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Fall Semester

August 30
Classes begin 7:30 a.m.
September 3—Labor Day
Classes in session
November 21
Thanksgiving vacation begins 5:20 p.m.
November 26
Classes resume 7:30 a.m.
December 15
Classes end 12:20 p.m.
December 17
Final exams begin 8 a.m.
December 22
Semester ends 9 p.m.

1974

JANUARY

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Spring Semester

January 7
Classes begin 7:30 a.m.
March 2
Spring vacation begins 12:20 p.m.
March 11
Classes resume 7:30 a.m.
April 27
Classes end 12:20 p.m.
April 29
Final exams begin 8 a.m.
May 4
Semester ends 9 p.m.
May 12
Commencement

Summer Session, 1974

June 17
Classes begin 7:30 a.m.
July 4—Independence Day
Holiday
August 6
Classes end 5:30 p.m.
August 7
Final exams begin 8 a.m.
August 9
Session ends 9 p.m.

PURDUE UNIVERSITY BULLETIN

Volume 73 October 1972 Number 4

Second class postage paid at Lafayette, Indiana. Issued by Purdue University 22 times a year: three times each in January, February, and December; twice in March, April, May, and June; once each in July, August, September, October and November.

School of Technology

Announcements for the Year 1973-74

Calumet Campus
North Central Campus
West Lafayette Campus
Indiana University-Purdue University,
Campus at Fort Wayne
Indiana University-Purdue University
at Indianapolis

PUBLISHED BY THE UNIVERSITY
WEST LAFAYETTE, INDIANA

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About Purdue University

PEOPLE ARE PURDUE'S GREAT STRENGTH. In just a century from a staff of six and a student body of 39, Purdue's faculty has grown to over 2,100 and its student body to more than 35,000.

A corps of astronauts, three U.S. secretaries of agriculture, college and corporation presidents, a U.S. senator, and a Nobel prize-winner claim Purdue as their alma mater. These are only a few of more than 120,000 alumni who have had an impact upon the state, the nation, and the world.

Purdue people come from different backgrounds. This variety reflects a longstanding policy of the University's Board of Trustees: All educational services and programs are open to all academically qualified individuals with no discrimination with respect to creed, national origin, race, or sex.

Purdue was founded for the people. Making higher education available to them was the plan when, in July 1862, President Lincoln signed the Morrill Act. This act granted public lands to any state which would use the proceeds of the sale of this land for the support of a college to teach "agriculture and mechanic arts."

Three years after passage of the land-grant act, the General Assembly of Indiana voted to take advantage of it. Various communities vied to be the site of the new college. John Purdue, a Lafayette civic leader, and other Tippecanoe County citizens offered $200,000 and 180 acres of land to establish the institution. In 1869 the assembly voted to accept this offer and, in appreciation, to name the college Purdue University.

For over 100 years Purdue has functioned in the tradition of the land-grant university—a tradition of awareness of the needs of the people. Purdue has continued to foster "agriculture and the mechanic arts." In addition, it has increased its range of disciplines and launched numerous interdisciplinary programs. Therefore, Purdue ranks 19th in size among the 2,400 U.S. colleges and universities and is one of the 48 leading institutions with membership in the Association of American Universities.

Dedicated people—administrators, faculty, and citizens—are responsible for Purdue's physical growth. Originally, the campus was made up of three buildings rising from Indiana farmland. Today its main campus in West Lafayette comprises 120 major buildings on 613 acres. In some 270 research labs many programs of diversified research are carried out.

The University has become the cultural and recreational center for northwestern Indiana. In the Purdue Memorial Union and Stewart Center are facilities to handle student activities, as well as conferences and short courses attended by more than 75,000 people annually.

The Edward C. Elliott Hall of Music houses 6,083 spectators for entertainment ranging from speakers to Broadway musicals. Additional thousands flock to the Ross-Ade Stadium and Mackey Arena for Boilermaker football and basketball.

But all of Purdue is not in one location. From the West Lafayette Campus, the University has expanded to three regional campuses at Fort Wayne, Hammond, and Westville and is affiliated with Indiana University-Purdue University, Indianapolis (IUPUI). In addition, nearly 15,000 acres in the state are under University control; most of this land is used for agricultural research.

People are important at Purdue. One measure of how important is the University's diversified areas of instruction which fulfill society's requirements as well as the individual's interests. Purdue's ten schools have led the University to its present position of leadership and influence. The schools are:

School of Agriculture. Instruction is offered in agricultural science, agricultural business, and agricultural production. More than 10,000 acres of farmland serve as laboratories for research and instruction. Campus laboratories supplement classroom instruction.

Schools of Engineering. For almost a half century, the University has been the largest or second largest in undergraduate engineering enrollment in America. Students in these schools choose from curricula in 11 major areas ranging from agricultural to nuclear engineering. In addition, special curricula are available in the Division of Interdisciplinary Engineering Studies, and a special baccalaureate program in land surveying has been added recently.

School of Home Economics. The school is considered outstanding in preparing men and women for careers in home economics. Students choose from 17 different areas. A two-year associate degree in food service and lodging supervision is offered. It is one of the largest schools of home economics in the nation.

School of Humanities, Social Science, and Education. Essentially all of the traditional disciplines of the liberal arts are offered by the school. Majors and minors are available in all 14 of the school's departments, and some 125 separate areas of specialization exist from which the student may choose to prepare himself in the humanities, the social sciences, or in education.

School of Industrial Management. The school offers a broad general education either in economics or business, with major understanding of the basic areas of management, bridged to the technological skills of engineering, statistics, and computer sciences.

School of Pharmacy and Pharmacal Sciences. Many of the prominent pharmacists, pharmaceutical scientists, and environmental health specialists in Indiana and the nation are Purdue graduates. Students who apply for admission to this school to become registered pharmacists first take one year in the School of Science's prepharmacy option. Students who choose the environmental health option are admitted directly into the school as freshmen.

School of Science. More students are enrolled in science courses at Purdue than at any other American university.. Its research accomplishments and leadership in revitalizing curricula in the sciences have brought wide acclaim.

School of Technology. This school annually awards a large number of Associate in Applied Science (two-year) degrees. Many students enter the 2 + 2 educational plan and, after earning an associate degree in two years, continue for a Bachelor of Science degree in two more years. The school also awards traditional bachelor and graduate degrees.

School of Veterinary Science and Medicine. The only school in the state, and one of only 18 in the United States which grants the Doctor of Veterinary Medicine degree, it graduated its first class in 1963.

Graduate School. All programs of graduate study and research leading to advanced degrees come under the jurisdiction of this school. This includes programs of study leading to the degrees of Doctor of Philosophy, Educational Specialist, Master of Science, Master of Arts, and Master of Science in the various professional fields. Graduate study in management and economics is offered by the Krannert Graduate School of Industrial Administration.

School of Technology

MISSION, PROGRAMS, AND FUNCTIONS

The mission of the School of Technology is to provide appropriate career educational opportunities to students whose technological interests and aptitudes are essentially application oriented. The goal is to produce occupationally ready college graduates with salable skills to meet defined technical manpower needs, primarily for Indiana business, industry, and service agencies. In addition, the school provides professionally prepared teachers and leadership personnel for the field of industrial education. Academic programs in the School of Technology which satisfy these goals are now being offered in the following areas:

1. Two-year associate degree programs in engineering technology and related fields;
2. Two-year associate degree programs in nursing and mental health;
3. Two-year associate degree programs in aviation technology;
4. Associate degree program for professional foremen;
5. Bachelor degree programs for associate degree graduates (aviation, computer, construction, electrical, industrial and mechanical technologies, and nursing);
6. Bachelor degree programs in industrial supervision;
7. Bachelor degree programs in industrial education (industrial arts, vocational-industrial and technical teacher education);
8. Selected graduate-level programs in industrial education offered in cooperation with the Graduate School;
9. Continuing education programs for adults.

State manpower needs, educational requirements, and student interests are continuously surveyed by the school's Office of Manpower Studies. A close liaison with employers and graduates provides feedback information to evaluate and update programs. New programs are considered primarily on the basis of state needs, student interest, and availability of resources.

Accreditation. There are several different agencies that accredit programs for the various curricula. These include the Engineering Council for Professional Development (for engineering technology programs), the National League for Nursing (for nursing programs), the Federal Aviation Administration (for aviation technology programs), etc. Program accreditation is identified on the page depicting the individual plan of study.

Admission

STUDENTS MAY BE ADMITTED to the School of Technology as (1) regular students or (2) temporary students. A regular student, upon satisfactory completion of a prescribed curriculum, may be awarded the appropriate degree. Temporary students are not eligible for the award of a degree.

PREPLANNING AND COUNSELING

While you are in high school—probably during your early years there—you begin to think about where you are going to college.

What are the educational opportunities at Purdue? What are the admission requirements? One of the counselors in the Office of Admissions will be glad to discuss such questions with you when you visit the University.

During the summer you are especially encouraged to come to the campus and take advantage of the Summer Visitors' Program. You will be given a tour of the campus and shown slides of life at the University. An admissions counselor will be available to answer any questions you might have, and arrangements can be made for you to talk with an academic counselor in your specific area of interest.

PROCEDURE

When you decide to apply for admission to Purdue (whether you are entering from high school, transferring from another institution, or re-entering after being out of school for a time), write to: Director of Admissions, Purdue University, West Lafayette, Indiana 47907.

Your first letter of inquiry about admission should include: (1) the amount of school training you have completed; (2) your plans for further education, indicating your field of specialization; and (3) the approximate date you plan to enter Purdue. On the basis of the information in your letter, the Office of Admissions will send you an official application form, as well as material to help you in making decisions.

When you are entering directly from high school, the Office of Admissions suggests you file your application for admission as soon as possible after completing six semesters of high school work.

ADMISSIONS CRITERIA

Your acceptance as a new student in the University is influenced by many factors. The Admissions Committee is guided by the following:

1. Graduation from a high school accredited by a state Department of Public Instruction.
2. The extent to which you meet or exceed minimum subject matter requirements. Almost all applicants far exceed the minimum require-

ments which are indicated in the table below. For admission to the School of Technology, your record must include:

Subjects	Number of Semesters
Algebra*	2
Geometry*	2
Laboratory science	2
English	6
History or social studies	2

3. Quality requirement
   a. An Indiana applicant, in order to be eligible for consideration, must be an upper-two-thirds quality student.

      Upper-two-thirds quality is usually met by rank in the upper two-thirds of the high school graduating class or SAT scores (V + M) totaling 850 or above (ACT composite totaling 18 or above).

      Admission is based upon all those academic factors relating to the applicant's record that when combined with the test data indicate a reasonable chance for success in a specific Purdue program.

   b. An out-of-state applicant, in order to be eligible for consideration, must be an upper-third-quality student.

      Upper-third quality is usually met by rank in the upper third of the high school graduating class or SAT scores (V + M) totaling 1050 or above (ACT composite totaling 22 or above).

      Admission is based upon all those academic factors relating to the applicant's record that when combined with the test data indicate a good chance for success in a specific Purdue program.

4. Required tests
   a. All applicants who have not completed a full year of college work are required to take either the College Board Scholastic Aptitude Test (SAT) and the College Board Achievement Tests in English, mathematics, and chemistry (another science if chemistry was not taken in high school); or, the American College Test (ACT). The CEEB Achievement Tests are used by the academic counselors to place students in the appropriate levels of English, mathematics, and chemistry, rather than for admission.

      It is recommended that the SAT or ACT be taken in the spring of the junior year or fall of the senior year and that the achievement tests be taken in the spring of the senior year.

   b. Indiana applicants will have their test results considered in conjunction with other available information.

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* Mathematics—A student whose program requires MA 150 and who does not qualify for 150 as indicated by the placement tests in algebra and trigonometry and high school grades will be assigned to MA 111 as a prerequisite for 150. Thus it is strongly urged that he complete MA 111, or equivalent, in the summer session preceding entrance into full-time study. Otherwise, the student may require five semesters to complete his program.

c. Out-of-state applicants must rank in the top third of the Purdue distribution on the Scholastic Aptitude Test (SAT) or meet the high school rank requirements above in order to receive consideration for admission. From these applicants the out-of-state roster will be selected, the number to be determined by the space available.

5. Information provided by your high school counselor.

Advanced Deposit on Fees

Are you a new student admitted for the fall semester? Then you must make an *advanced deposit* of $50 which is nonrefundable. This deposit is to reserve a place for you on the new student roster. Students admitted on or before March 31 must submit the deposit by April 20. Those admitted after March 31 must submit the deposit within three weeks (21 days) after the date of the Offer of Admission.

Should you receive an Offer of Admission but fail to make the required deposit of $50 within the time allotted, you automatically forfeit your right to a place on the new student roster.

The $50 advanced deposit will be applied on your first semester fees. If, for valid reasons, you find you cannot attend the University, notify the Office of Admissions prior to July, and you will receive a refund of $15.

Early Entrance for Superior Students

As a candidate for the baccalaureate degree, you are expected to graduate from high school. However, you may be considered for admission to the University prior to high school graduation if you have established a superior record, have completed most of the college preparatory courses, have very few academic courses remaining to choose from in high school, and are strongly recommended by your high school counselor.

Admission With Advanced Standing

On the basis of your CEEB advanced placement examination results, Purdue departmental examination results, or your high school record, you, as a freshman, may receive advanced credit and/or advanced placement.

Transfer Students

If you are transferring from another college or university, you must comply with the following admissions procedures:

1. Submit an application for admission on the prescribed form through the director of guidance of the high school from which you were graduated.
2. File the application for admission when you begin your last semester or term at the college you are currently attending.
3. Forward an official transcript of work done in institutions previously attended. A separate transcript must be sent directly from each institution, regardless of whether credit is requested.

4. Request that the dean of men/dean of women of each institution previously attended complete and forward to the Office of Admissions a personal report. (The appropriate form will be mailed to the student upon receipt of his application.)
5. To be assured of consideration for admission, the completed application must be received 30 days before the beginning of classes of any given semester.

To be eligible for consideration, you must have a C average or better, must meet the subject matter requirements, and must be in good academic, social, and disciplinary standing at the college (colleges) you previously attended.

Transfer or Advanced Credit

Credit for courses in Purdue University will be given for work of equivalent character and amount successfully completed at another accredited college. Advanced standing will be determined on the basis of these credits. Advanced credit will be regarded as provisional and may be withdrawn by the director of admissions upon recommendation of the head of the department concerned if work is not satisfactorily completed.

When credit earned at another college or university is transferred to Purdue and accepted toward advanced standing, the credit is converted into terms of Purdue courses and applied on the program of study. It remains for you, the student, to complete the program, and your schedule of courses each term will be adjusted accordingly. It does not follow that your classification in the University or the time necessary for completion of the required work for a degree will be in line with what was expected at the previous institution. Grades are not transferred; only credit in the course is recorded.

All credentials are submitted with the understanding that they become the property of Purdue University.

Summer Advanced Enrollment (Day on Campus)

The Office of Admissions invites you to campus for one day of advanced enrollment during the summer before your first semester as a new student. This day is set aside for you to confer with your academic counselor and to select your first-semester classes. The University will then carry through the registration process, mail you a fee statement, and upon payment of the fees, mail your schedule of classes to you.

Nondegree Students

You are an adult living in the Greater Lafayette area and you want to take a course at the University. You don't want a degree. You aren't interested in following a regular plan of study. You simply want to take a course. Is it possible? Yes, if you show that you have the background required for the course, or courses, in which you are interested. The Office of Admissions will advise you on how to be admitted as a nondegree student.

Foreign Students

If you are an applicant from a foreign country, you will be admitted without examination on the basis of credentials certifying that you have completed preparatory studies equivalent to those specified under the section "Admissions Criteria." Your credentials must also certify to the full extent and character of your previous education. When transcripts and other credentials are in Oriental, Slavic, and certain European languages, they must be accompanied by official translations.

As a foreign applicant, you must submit satisfactory evidence of your ability to read, write, and speak English.

The adviser to foreign students will assist you in entering the University and provide counseling and other services after you have arrived on campus.

Military Training

ROTC programs are offered (not required) by all three services—the Army, the Navy, and the Air Force. Each offers a course which leads to a commission as an officer upon graduation. Military courses are pursued in conjunction with the academic curriculum and receive academic credit.

Men with evidence of honorable discharge or separation from active duty in the armed forces may apply for credit in basic armed forces training if they desire to use ROTC as an elective sequence.

Time of Entrance

Purdue University offers instruction during two semesters and a summer session. You may begin a program of study with any regularly scheduled session. These usually begin three times a year—in August, January, and June.

Regional Campus Admission

You may wish to begin your university studies at one of Purdue's regional campuses. If so, write to the admissions officer at that campus. Addresses of the regional campuses are:

Calumet Campus, Purdue University
2233 171st Street
Hammond, Indiana 46323

North Central Campus, Purdue University
Junction Indiana Toll Road and U.S. 421
Westville, Indiana 46391

Fort Wayne Campus, Indiana University-Purdue University
2101 Coliseum Boulevard East
Fort Wayne, Indiana 46805

Purdue also is affiliated with and offers courses at

Indiana University-Purdue University at Indianapolis (IUPUI)
1201 East 38th Street
Indianapolis, Indiana 46205

Expenses and Financial Aid

MINIMUM COSTS

How much a year of study at Purdue costs depends a great deal on how much you want to spend. Basic minimum costs for a two-semester school year on the West Lafayette Campus are:

Items	Estimated Costs Resident	Nonresident
University fees	$ 700	$ 700
Tuition		900
Books and supplies	150	150
Board and room	1,140	1,140
Sunday evening meals	60	60
Miscellaneous	400	450
Total	$2,450	$3,400

Rates are subject to change without published notice.

Male students electing Army or Air Force ROTC will be required to pay a $20 two-year military uniform deposit in addition to the regular University fees.

University fees include the general service, student activity, recreation facilities, and hospital fees. The hospital fee covers outpatient care, emergency room service, laboratory services, and physical therapy. The activity and recreation facilities fees admit students to athletic events and the convocation series.

Miscellaneous expenses include such items as clothing, transportation, telephone, newspapers and magazines, dry cleaning and laundry, movies, etc.

UNIVERSITY FEES

Fees and deposits for the programs included in this catalog follow. All fees are payable at the time of registration each semester. Fees are subject to change by the Board of Trustees without notice.

For Programs Offered at West Lafayette Campus

1. The fees for the various programs offered at the West Lafayette Campus are:

Fees	Each Semester
Building facilities fee	$ 30.00
General service fee	255.00
Medical and infirmary fee	20.50
Student activity fee (Purdue Memorial Union, Edward C. Elliott Hall of Music, and University Convocations)	25.50
Recreation facilities fee (including admission to home athletic contests, locker in gymnasium, towels, etc.)	19.00
Total Fees for Resident Student	$350.00

Continued

Tuition fee for students from outside the state 450.00
Total Fees and Tuition for Students from Outside the State $800.00

2. Fees for the credit flight and support courses are established as follows:
   a. Flight enrollment—$285.
   b. Flight continuation fee—$350 with an additional $80 continuation fee for the instrument course.
   c. All three-hour ground school support courses are charged at the established rate of $25 per semester hour for those who are not otherwise enrolled in the University for that semester.
   d. There will be no refund provision.
3. Fees for noncredit personal service courses may vary for each course.
4. Additional fees required for nursing students in the associate degree program include the cost of uniforms and transportation expenses to and from the hospitals and/or field trips. Approximately $6 is required to cover the cost of the National League for Nursing Achievement Tests.

For Programs Offered at Other Purdue University Campuses

1. Curricula in technology
   a. Courses numbered from 100 to 499—$20 per credit hour ($40 for out-of-state students) plus $5 per laboratory hour.

   Example: (1.) **CHT 202. UNIT OPERATIONS II.** Class 3, Cr. 3 × 20 = $60.
   (2.) **EET 214. ELECTRICITY FUNDAMENTALS.** Class 1, Lab. 4, cr. 2, (2 × 20) + (4 × 5) = $60.

   b. Courses numbered 500 and above—$25 per credit hour ($50 for out-of-state students) plus $5 per laboratory hour. Fees may not necessarily apply to certain programs.
2. Personal service courses (courses numbered under 100)—$20 per certificate unit plus $5 per laboratory hour, unless otherwise noted in the description of the course.
3. Nursing—about $40 for uniforms should be added to other fees. Cost of transportation to and from hospitals and for field trips is paid by the individual students.
4. Practical nursing program (Calumet Campus only) fees for first 16 weeks of classroom and laboratory instruction are $225.
   a. Courses scheduled during the four two-week periods of each of the four cooperating hospitals are individually priced and listed along with the course description.

Breakage Fees. Course fees include the cost of normal breakage and wear and tear on equipment. An additional charge will be levied against individuals for excessive waste, loss, or breakage that may occur. Such special charges must be paid before course credit will be given.

Activity Fees (effective at Calumet, Fort Wayne, and North Central campuses)
$15 per semester if 9 credit hours or more are taken.

Activity Fees (effective at IUPUI Campus only)

12 semester hours or more	$3
8-11 semester hours	2
1-7 semester hours	2

Graduate Fees (effective at all campuses except West Lafayette)

Resident	$25
Nonresident	50

Late Registration Fees

$5 per course during week of classes, with a maximum of $10.

Diploma Fee. Students in applied technology must pay a diploma fee of $10 not less than 30 days before the close of the semester in which they expect to complete their work for an associate degree.

Special Examination Fees. For course credit by examination by a student who is admitted or registered as a temporary student, or any current student who has not paid full fees, the cost per course is $25.

Service Fee. Students requesting duplicate copies of fee receipts, schedule cards, etc., must pay a service fee of $1.

Refunds. To be eligible for a refund the student must notify the extension office and apply for a refund at the campus where he is registered at the time of his withdrawal.

Deposits on equipment are subject to regular service and breakage charges.

Refunds are not transferable from one registration period to another or from one student to another.

FINANCIAL AIDS

Financing an education generally takes planning, work, and, in many cases, some assistance. Whether you are a new or continuing student, Purdue University maintains a complete program of financial assistance to help you. Most types of aid are based upon financial need and academic ability. Scholarships, grants, long-term loans, part-time employment, or some combination of these aids are obtainable if you are a student who qualifies.

Alumni and friends of the University, the state and federal government, business and industry, and the University itself provide scholarship, grant, and loan funds.

Mostly your course of study is not a consideration in granting aids. However, some scholarship and loan funds are specifically designed for those applicants in a particular curriculum.

For additional information, see *Introduction to Purdue* and *Financial Aid for Students,* both Purdue University bulletins. Or, contact the Division of Financial Aids, Agriculture Annex II, West Lafayette, Indiana 47907.

Student Welfare

LIVING ACCOMMODATIONS

WHILE YOU MAY ENJOY the chatter of a roommate and having meals cooked for you, another person may need silence to concentrate and prefer to do his own cooking. As a Purdue student you have a wide choice in such matters. You

may live in a University-operated residence hall, in a fraternity or sorority, in a cooperative house, or in a privately-operated facility in the local community.

On your application for admission to the University, you will be asked to indicate the type of living accommodations in which you are interested. If you are accepted as a student at the University, you will receive information from the appropriate housing office on the type of accommodation you specified on your application for admission. Acceptance for admission to the University does not, however, guarantee the availability of housing accommodations.

If, on your application for admission, you specified preference for housing operated by the University, the Residence Halls or the Married Student Housing Office will send you an application for accommodations which you must fill out and return to them. Note that this application for accommodations is entirely separate and in addition to your application for admission to the University.

Residence Halls for Undergraduate Men and Women

University owned and operated, self-supporting residence halls now provide accommodations for approximately 10,000 single undergraduate men and women.

The halls for men are comprised of both the traditional-type residence halls and the one-story court-type residence hall units. The traditional-type halls are Cary Quadrangle, providing accommodations for 1,600 students, and the Owen, Tarkington, and Wiley Halls, each providing space for 700 men. Three eight-story structures—McCutcheon, Harrison, and Shreve Halls—house approximately 800 students each and are coeducational units with men students assigned to one wing and women students assigned to the alternate wing.

The court-type halls provide double-room accommodations in small living groups of 16-20 that have their own living rooms and washroom facilities. The Fowler Courts provide 600 of these spaces; board services are provided in the adjacent cafeteria known as Fowler House. For several years, the Fowler Courts have been operated as a coeducational facility and this plan of operation is expected to continue. The Terry Courts and O. P. Terry House are comparable to the Fowler Courts and Fowler House and may also be operated coeducationally with men and women housed separately by unit buildings.

Duhme, Shealy, Wood, Warren, and Vawter Halls comprise the original group of women's residence halls and normally are referred to as the Windsor Residence Halls. Meredith Hall accommodates 600 women and Earhart Hall houses 800 co-eds. All contain generous lounge space, recreation room, dining room, kitchen, and post office facilities.

All accommodations provide for a combined, full academic year, room and board agreement. The cost for two semesters in double-room occupancy varies from $1,040 to $1,170. (Rates quoted are subject to change as approved by the Board of Trustees.)

University Operated Accommodations for Married Students

University owned and operated, self-supporting apartments for married undergraduate and graduate students are available in a wide variety of 1,638 apartments. These facilities range from efficiency units to two-bedroom apartments, and all of them are located within one mile of the campus. For a number of years the demand for these apartments has exceeded the number available for assignment. Early application is suggested.

Furnished apartments are available in efficiency units or in one- and two-bedroom types.

Unfurnished apartments (equipped only with a stove and refrigerator) are available in one- and two-bedroom sizes.

Rental rates include all utilities, except telephone. The rates are subject to change without notice as approved by the Board of Trustees. One-bedroom apartment rates vary from $82 per month for an efficiency to $132 per month for the latest completed one-bedroom furnished type. Two-bedroom rates range from $108 per month on an unfurnished basis to $123 per month in a furnished status. No tax money is involved in the construction or operation of these apartments.

For more information regarding description of facilities, rates, operating regulations, and application forms, write to: Director of Married Student Housing, Nimitz Drive, Purdue University, West Lafayette, Indiana 47907.

PLACEMENT SERVICES

One of the reasons you are going to college is to prepare for a career that will bring you satisfaction. Two placement offices on campus are set up to help you find a job that will launch you into your chosen career.

University Placement Service

The University Placement Service staff will assist you with your employment search and career development. Counseling, guidance, testing, and a wide variety of vocational and employer information are available to you through this office.

The University Placement Service maintains contacts with a large number of organizations in the industrial and business world and with government agencies. You may use its facilities to learn of employment possibilities and to arrange for personal interviews with employer representatives.

Educational Placement Office

The Educational Placement Office provides you with service and information if you are interested in teaching, administrative, and supervisory positions in public and private elementary and secondary schools, as well as colleges and universities. When you register with the Educational Placement Office, they maintain a lifetime repository of your credentials. In addition, the office arranges personal interviews for you with prospective employers who come to the campus seeking qualified personnel.

After you graduate, the Educational Placement Office will continue to help you with your professional advancement if you demonstrate interest and proficiency in the teaching profession.

Special Facilities

COMPUTING CENTER

IT IS COMMON PRACTICE at Purdue to stop at the Computing Center after a convocation or movie "to see if my program worked."

Whether you are in humanities, engineering, or any other school of the

University, it is quite possible that you will use the Purdue University Computing Center facilities. And the computational facilities you will use are among the best to be found at an academic installation in the United States. The entire academic-research community—students and faculty—make use of the facilities, most of which are located in the Mathematical Sciences Building. Additional facilities are in the Engineering Administration Building and the Krannert Building.

The major computing system operated by the center is a CDC 6500 computer with 98,304 words of main memory (60 bit words) and 125,000 words of extended core storage (ECS). The dual processor 6500 also has over 26,000,000 words of fast disc storage plus tapes and disc pack units and a large array of peripheral equipment.

The center also operates three IBM 7094 computers. One 7094 is intimately tied to the 6500 system and drives the terminal system called PROCSY (Purdue Remote On-line Console System). Through PROCSY a large number of teletype terminals—64 installed as of July 1972—provide remote job entry, editing, and interactive computing to users who may be located at a considerable distance from the computing center. The 7094 systems also run thousands of Fortran jobs each day by way of PUFFT (Purdue Fast Fortran Translator), a system developed at Purdue and designed for the efficient processing of very large numbers of relatively short student jobs.

Physical operation of the available computing equipment, creation and maintenance of systems programs, general routines, and subroutines, together with attendant documentation and distribution are the responsibility of the center staff. Flow diagramming and/or expression of procedures in compiler languages is primarily the responsibility of the user of the computing center equipment. The staff of the center serves in an advisory capacity in the latter case, providing information on numerical procedures, individual instruction, and specialized programming assistance where appropriate. A variety of short, noncredit courses on programming are taught on a regular basis.

A statistical section provides statistical programs for the computer to research workers on campus.

LIBRARIES

While you are at Purdue, the University Libraries and their services will be an important part of your life.

Over a million volumes are housed in the General Library located in the Stewart Center and in 28 departmental or special libraries and collections throughout the West Lafayette Campus. In addition to materials in book and journal formats, you will find that the University Libraries have over 400,000 microfilms (reel, film, microcards, microfiche, etc.), These make available to you older scholarly materials and technical reports not readily attainable in other forms. The libraries are a depository for federal documents, and they also receive Indiana state documents. Most materials are on open shelves for ready access and use.

You and your friends may choose to unravel a knotty course-problem in one of the special study rooms located on each floor of the General Library. Or you may want to spend some rainy Sunday afternoons in the Bookstall enjoying science fiction and a cup of coffee. When your mind rebels against

reading a lengthy journal article, the art exhibits in the General Library lounge may refresh you.

During your college career you will use one or more of the departmental libraries. The University has a tradition of strong departmental libraries, where journals and monographs for their particular fields are housed. These libraries also have the abstracting and indexing services and special bibliographies needed for research and investigation in the various subjects.

Special collections found in the University Libraries include the George Ade collection, the Anna Embree Baker collection of works designed and printed by Bruce Rogers, the Krannert economic history collection, and the W. F. M. Goss library of engineering history.

For more complete information about the University Libraries, see *Guide to Purdue University Libraries* available in the General Library. And remember, the staff is willing and able to give you help at any time in using the libraries.

AUDIO-VISUAL CENTER

In this day of media messages, you are sure to find your way to the Audio-Visual Center located on the ground floor of Stewart Center. The center makes available for student and faculty use a variety of audio-visual materials, equipment, and services.

The Film Library includes 3,500 motion pictures, 6,500 tape recordings, 20,000 slides, and a number of other types of media. You will be provided with facilities to use items from the Film Library while you are in the Audio-Visual Center. Or, you may borrow equipment for use in other locations.

Further services of the Audio-Visual Center include a graphics workshop, a copy service, a projection service, an equipment repair service, and consultation on the use of instructional materials and equipment.

Student Counseling Service

COUNSELING

The Office of Counseling Services for the School of Technology on the West Lafayette Campus is located in Michael Golden Engineering Laboratories, Room 147. If you want information concerning career opportunities and educational programs offered by the School of Technology, contact this office. If you desire information concerning regional campus programs, contact the admissions office at the respective campus.

When you become a student, you are assigned an academic adviser who works closely with you throughout your career on campus. Your adviser advises you regarding selection of courses and keeps you informed about employment opportunities.

Calumet Campus

Architectural Technology ..... G. R. Sullivan
Chemical Technology ..... H. D. Fayle
Civil Engineering Technology ..... D. E. Cochran
Computer Technology ..... John Maniotes
Electrical Technology ..... L. E. Brunner
Industrial Education ..... A. J. Parker
Industrial Engineering Technology ..... C. D. Rose
Industrial Supervision ..... B. A. Hindmarch
Mechanical Drafting Design Technology ..... E. C. Gallett
Mechanical Engineering Technology ..... P. Perkins
Metallurgical Engineering Technology ..... A. L. Kaye
Nursing (Practical, AAS, BS) ..... Joyce Ellis

Fort Wayne Campus

Architectural Technology ..... R. T. Flemming
Civil Engineering Technology ..... L. W. Smith
Computer Technology ..... C. E. Crosswhite
Electrical Technology ..... D. E. Nold
Industrial Education ..... F. L. Bushong
Industrial Engineering Technology ..... W. W. Worthley
Industrial Supervision ..... C. H. Creasser
Mechanical Drafting Design Technology ..... W. W. Worthley
Mechanical Engineering Technology ..... W. W. Worthley
Mental Health Technology ..... S. Y. Kepes
Nursing ..... Doris Mack

IUPUI

Architectural Technology ..... W. E. Davis
Chemical Technology ..... W. K. Fife
Civil Engineering Technology ..... R. J. Beck
Computer Technology ..... R. G. Crosier
Electrical Technology ..... P. K. Sharp
Industrial Education ..... Edgar Fleenor
Industrial Engineering Technology ..... M. S. Bowman
Industrial Supervision ..... O. A. Paul
Mechanical Drafting Design Technology ..... R. A. Peale
Mechanical Engineering Technology ..... R. A. Peale

North Central Campus

Architectural Technology ..... H. S. Driggs
Civil Engineering Technology ..... R. L. Taylor
Computer Technology ..... J. F. Gallagher
Electrical Technology ..... W. L. Stoakes
Industrial Education ..... R. F. Schwarz
Industrial Engineering Technology ..... R. M. Bobillo
Industrial Supervision ..... R. M. Bobillo
Mechanical Engineering Technology ..... F. R. Lisarelli
Nursing ..... Bernice Schaapveld

West Lafayette Campus

Architectural Technology ..... D. D. Moss
Aviation Electronics Technology ..... W. P. Duncan
Aviation Maintenance Technology ..... J. R. Rardon
Civil Engineering Technology ..... D. D. Moss
Electrical Technology ..... V. W. Hoeche
General Aviation Flight Technology ..... G. W. Dennis
Industrial Education ..... D. L. Householder
Industrial Illustration Technology ..... J. V. Smith
Industrial Supervision ..... M. H. Steel
Mechanical Engineering Technology (AAS) ..... R. L. Miller
Mechanical Technology (BS) ..... W. F. Harrison
Nursing (AAS) ..... Dixie Emler
Nursing (BS) ..... Ida Casey
Professional Foremen ..... C. D. Fuller
Professional Pilot Technology ..... C. F. Holleman

Plans of Study

TYPICAL PROGRAMS for students pursuing degrees in the areas within the School of Technology are listed on the following pages. Listed are plans of study for students in two-year programs leading to the degree of Associate in Applied Science, two-year add-ons, and four-year programs leading to the degree of Bachelor of Science, and certificate programs.

ABBREVIATIONS

AET—Aviation Electronics Technology
AMT—Aviation Maintenance Technology
ART—Architectural Technology
AT—Aviation Technology
BCHM—Biochemistry
BIOL—Biological Sciences
CDFL—Child Development and Family Life
CET—Civil Engineering Technology
CHM—Chemistry
CHT—Chemical Technology
COM—Communication
CNT—Construction Technology
CPT—Computer Technology
ECON—Economics
ED—Education
EET—Electrical Engineering Technology
EG—Engineering Graphics
ENGL—English
F&N—Foods and Nutrition
GFT—General Aviation Flight Technology
GNT—General Studies
HIST—History
H&S—Health and Safety
IE—Industrial Engineering
IED—Industrial Education
IET—Industrial Engineering Technology
IIT—Industrial Illustration Technology

INDM—Industrial Management
INSM—Institutional Management
IS—Industrial Supervision
MA—Mathematics
MDT—Mechanical Drafting Design Technology
MET—Mechanical Engineering Technology
MHT—Mental Health Technology
MTT—Metallurgical Engineering Technology
NT—Nursing
PCOL—Pharmacology
PFT—Professional Foremen
PPT—Professional Pilot Technology
PHIL—Philosophy
PHYS—Physics
POL—Political Science
PSY—Psychology
SOC—Sociology
STAT—Statistics

ASSOCIATE IN APPLIED SCIENCE

Science and technology range from extremely simple to highly complex and abstract activities. At one extreme are the "professionals"; at the other, the mechanics, draftsmen, and service personnel. Within this broad spectrum, the educational backgrounds include doctor's degrees, master's degrees, bachelor's degrees, and associate's degrees at the University level, as well as certificates and diplomas from other post-high-school educational and training institutions.

Frequently, the degree level is indicative of the job level. For example, in the medical profession, job titles include physicians (doctor's degree), medical technologists (bachelor's degree), and nurses (associate degree) at the University level as well as the practical nurse, hospital technician, and operating room technician (diploma) offered at other post-high-school educational institutions.

The Associate in Applied Science degree offered by Purdue's School of Technology is awarded after two years of University-level study in an applied scientific field. Graduates of such programs are called technicians.

A technician is an employee whose job requires applied technical knowledge and applied technical skills. His work is somewhat akin to that of the professional, but more narrow in scope. His job requirements normally include those manipulative skills necessary to perform the technical tasks. In his field he has considerable technical knowledge of the materials and processes involved as well as knowing how to apply the principles of physical and biological sciences. In general, he uses instruments in contrast with tools. His contribution is mainly through mental effort in conjunction with application of skills. In many organizations he is not limited to a technician job but is permitted to move vertically in the organization to higher levels of responsibilities. This, of course, is dependent upon the individual's capability and his willingness to continue his education.

With the origination of the School of Technology in 1964, the Board of Trustees charged the school with the responsibility for the administration of all associate degree programs offered by the University at that time.

TWO-YEAR PLANS OF STUDY LEADING TO ASSOCIATE IN APPLIED SCIENCE DEGREE

There are 16 two-year curricula available on the four campuses of Purdue University and at IUPUI. It should be noted that all are not available at every campus. Refer to the beginning of each curriculum description for locations where it is offered. Curricula are listed as follows:

AET—Aviation Electronics Technology

AMT—Aviation Maintenance Technology

ART—Architectural Technology

CET—Civil Engineering Technology

CHT—Chemical Technology

CPT—Computer Technology

EET—Electrical Engineering Technology

GFT—General Aviation Flight Technology

IET—Industrial Engineering Technology

IIT—Industrial Illustration Technology

MDT—Mechanical Drafting Design Technology

MET—Mechanical Engineering Technology

MHT—Mental Health Technology

MTT—Metallurgical Engineering Technology

NT—Nursing

PFT—Professional Foremen

ARCHITECTURAL TECHNOLOGY

Offered at: All campuses

This curriculum is designed to prepare students for technological employment with architects, contractors, building materials suppliers, and various governmental agencies.

Emphasis is placed on architectural drafting, construction details, construction materials, specifications, regulations, and estimating, as well as on related courses in mathematics and physical science. Also included are courses dealing with some of the historic, economic, and human relation aspects related to the individual in our American industrial life.

Graduates are prepared to accept positions as architectural detailers, architectural draftsmen, estimators, expeditors, planning technicians, field inspectors, and sales representatives. Graduates may also continue their education by pursuing a Bachelor of Science degree with a major in construction technology.

FRESHMAN YEAR

First Semester

(2) ART 116 (Construction Drafting)
(2) ART 162 (Building Materials and Methods)
(3) CET 104 (Elementary Surveying)
(3) MA 147 (Algebra and Trigonometry for Technology I)*
(3) English†
(3) Social science elective

(16)

Second Semester

(2) ART 120 (Freehand Drawing I)
(3) ART 150 (Architectural Construction I)
(2) ART 172 (Systems of Construction)
(3) CET 160 (Statics)
(3) MA 148 (Algebra and Trigonometry for Technology II)
(3) COM 114 (Fundamentals of Speech Communication)

(16)

SOPHOMORE YEAR

Third Semester

(2) ART 220 (Freehand Drawing II)
(3) ART 222 (Architectural Construction II)
(2) ART 276 (Specifications and Contract Documents)
(3) ART 284 (Mechanical Equipment for Buildings)
(3) CET 260 (Strength of Materials)
(4) PHYS 218 (General Physics)

(17)

Fourth Semester

(3) ART 224 (Architectural Construction III)
(2) ART 285 (Electricity for Buildings)
(3) CET 266 (Materials Testing)
(3) CNT 280 (Quantity Survey and Estimating)
(3) ART 210 (History of Architecture I) or
Nontechnical elective
(3) Business elective

(17)

* See mathematics footnote, p. 9.
† ENGL 100, 104, or 101 and 185 or 286.

AVIATION ELECTRONICS TECHNOLOGY

Offered at: West Lafayette.

The aviation electronics technology curriculum is a two-year program which leads to the degree of Associate in Applied Science. The program is a combination of technical and general academic studies offered by the Department of Aviation Technology for persons interested in avionic maintenance. The curriculum is designed to produce a graduate competent in trouble shooting, installation, and servicing of aircraft communication and navigation equipment.

Along with classroom theory and laboratory work, the curriculum includes specialized courses in aircraft electrical systems, communications, navigation, and pulse equipment.

Graduates of the aviation electronics technology curriculum may elect to continue their education in either industrial education or industrial supervision to earn a Bachelor of Science degree. Upon completion of the associate degree program, students who desire and are qualified may apply for a co-op work-study program with a major air carrier. The co-op arrangement is available only to those students pursuing a Bachelor of Science in industrial supervision.

FRESHMAN YEAR

First Semester		Second Semester	
(5)	MA 150 (Mathematics for Technology)*	(3)	EG 110 (Drafting Fundamentals)
(2)	ENGL 101 (English Composition I)	(3)	COM 114 (Fundamentals of Speech Communication)
(1)	EG 113 (Slide Rule and Graphs)	(3)	AT 130 (FCC Exam Preparation)
(5)	AT 132 (Electronics I)	(2)	AT 131 (Aircraft Electricity)
(2)	AT 135 (Avionics Laboratory I)	(5)	AT 134 (Electronics II)
(4)	AT 138 (Aircraft and Missile Orientation)	(2)	AT 136 (Avionics Laboratory II)
19		18	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(3)	MA 221 (Calculus for Technology I)	(3)	MA 222 (Calculus for Technology I)
(4)	PHYS 218 (General Physics)	(4)	PHYS 219 (General Physics)
(5)	AT 230 (Aircraft Nav/Comm Systems)	(3)	AT 233 (Aircraft Pulse and Microwave Systems)
(3)	AT 232 (Electronics III)	(3)	AT 234 (Electronics IV)
(2)	AT 235 (Avionics Laboratory III)	(3)	AT 236 (Aircraft Automatic Flight Control Systems)
		(2)	AT 237 (Avionics Laboratory IV)
17		18	

* See mathematics footnote, p. 9.

AVIATION MAINTENANCE TECHNOLOGY

Offered at: West Lafayette.

The aviation maintenance technology program is designed to qualify high school graduates as airframe and powerplant technicians and to give basic technical training as preparation for many industrial positions.

It is an intensive, two-year undergraduate program which has been approved by the Federal Aviation Administration. Graduates become licensed airframe and powerplant mechanics upon successfully passing the FAA examinations.

The curriculum includes specialized courses in aircraft maintenance and technology, as well as general academic courses. In the shops and laboratories, skills will be developed in engine and airframe inspection, maintenance, and repair. The shop activities stress the use of tools and test equipment.

The first year is devoted primarily to light aircraft maintenance and basic aircraft engines. During the second year, students will have the opportunity to get actual maintenance experience on operating aircraft, as well as continuing training in more advanced engines, structures, and systems.

Upon successfully completing the aviation maintenance program, students may continue for a Bachelor of Science in industrial education, industrial supervision, or manufacturing technology.

Students planning to pursue a degree in industrial supervision may apply for a cooperative work-learning program with a major airline or aircraft manufacturer.

FRESHMAN YEAR

First Semester		Second Semester	
(3)	IED 125 (Basic Metal Practices)	(5)	AT 115 (Aircraft Structures)
(1)	AT 100 (Introduction to Aviation Technology)	(5)	AT 116 (Airframe Maintenance)
(1)	AT 113 (Federal Air Regulations and Forms)	(3)	EG 110 (Drafting Fundamentals)
(5)	AT 112 (Aircraft Piston Engines)	(3)	COM 114 (Fundamentals of Speech Communication)
(4)	AT 114 (Aircraft Piston Engine Accessories)	(3)	Algebra and/or trigonometry elective
(2)	ENGL 101 (English Composition I)		
(3)	Algebra and/or trigonometry elective		
(19)		(19)	

SOPHOMORE YEAR

Third Semester

(2) AT 209 (Aircraft Welding and Materials)
(4) AT 213 (Aircraft Systems)
(5) AT 215 (Aircraft Electricity)
(1) EG 113 (Slide Rule and Graphs)
(2-3) English/communication elective
(3) Physics elective

(17-18)

Fourth Semester

(1) AT 210 (Aircraft Engine Operation)
(2) AT 211 (Transport Aircraft Maintenance)
(5) AT 214 (Aircraft Gas Turbine Engines)
(2) AT 216 (Aircraft Propeller Systems)
(1) AT 218 (General Aviation Aircraft Maintenance)
(2) AT 219 (Survey of FAA Mechanic Requirements)
(3) Laboratory science elective

(16)

CHEMICAL TECHNOLOGY

The program is designed to prepare young men and women for employment in the chemical and allied product industries. The knowledge gained will enable the technician to work under a chemist, chemical engineer, or plant supervisor in helping to develop procedures, make tests, develop research models, and to make the necessary technical measurements to operate a chemical project or plant. There are three options available in this program.

Pharmaceutical Option and Process Option

Offered at: Indianapolis.

FRESHMAN YEAR

First Semester

(4) CHM 109 (General Chemistry)
(3) ENGL 104 (English Composition I)
(1) ENGL 185 (Developmental Reading)
(3) IET 104 (Industrial Organization)
(5) MA 150 (Mathematics for Technology)*

(16)

Second Semester

(4) CHM 110 (General Chemistry with Qualitative Analysis)
(3) MA 221 (Calculus for Technology I)
(4) PHYS 220 (General Physics)
(3) POL 101 (Introduction to Government)
(3) COM 114 (Fundamentals of Speech Communication)

(17)

SOPHOMORE YEAR

Third Semester

(4) CHM 224 (Introductory Quantitative Analysis)
(3) MA 222 (Calculus for Technology II)
(4) PHYS 221 (General Physics)
(6-7) Technical electives

(17-18)

Fourth Semester

(4) CHT 225 (Quantitative Analysis, Instrumental)
(3) GNT 220 (Technical Report Writing)
(3) IS 252 (Human Relations in Industry)
(8-7) Technical electives

(18-17)

PHARMACEUTICAL OPTION ELECTIVES

(3) BIOL 103 (Principles of Biology)
(3) CHM 255 (Organic Chemistry)
(1) CHM 255L (Organic Chemistry Laboratory)
(3) BCHM 100 (Introduction to Biochemistry)
(3) CHM 256 (Organic Chemistry)
(1) CHM 256L (Organic Chemistry Laboratory)

PROCESS OPTION ELECTIVES

(3) CHT 273 (Physical Chemistry of Materials)
(3) CHT 201 (Unit Operations I)
(4) CHM 251 (Organic Chemistry)
(1) CHM 251L (Organic Chemistry Laboratory)
(3) CHT 202 (Unit Operations II)

* See mathematics footnote, p. 9.

General Industrial Option

Offered at: Calumet.

FRESHMAN YEAR

First Semester		Second Semester	
(4)	CHT 109 (General Chemistry)	(4)	CHT 212 (Industrial Chemistry: Qualitative)
(3)	COM 114 (Fundamentals of Speech Communication)	(3)	MA 221 (Calculus for Technology I)
(1)	ENGL 185 (Developmental Reading)	(5)	CHT 251 (Organic Chemistry)
(3)	IET 104 (Industrial Organization)	(3)	POL 101 (Introduction to Government)
(5)	MA 150 (Mathematics for Technology)*	(2)	ENGL 101 (English Composition I)
(16)		(17)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(4)	CHT 252 (Industrial Chemistry: Quantitative)	(4)	CHT 225 (Quantitative Analysis, Instrumental)
(3)	MA 222 (Calculus for Technology II)	(3)	GNT 220 (Technical Report Writing)
(4)	PHYS 220 (General Physics)	(3)	IS 252 (Human Relations in Industry)
(3)	CHT 273 (Physical Chemistry of Materials)	(4)	PHYS 221 (General Physics)
(3)	CHT 201 (Unit Operations I)	(3)	CHT 202 (Unit Operations II)
(17)		(17)	

* See mathematics footnote, p. 9.

CIVIL ENGINEERING TECHNOLOGY

Offered at: All campuses.
ECPD accredited at Calumet Campus.

This program is designed to prepare students for employment in the construction industry. The industry is made up of a myriad of small, diverse firms that collectively constitute the nation's largest industry. Emphasis is placed on the development of skills that are saleable throughout the industry. These skills include drafting, surveying, and estimating. The Associate in Applied Science degree is awarded at the completion of the program.

Graduates of this program accept positions with contractors, engineers, testing laboratories, material suppliers, and highway departments. They may work in the field as surveyors, field engineers, or inspectors; or they may work in an office as draftsmen, detailers, topographers, estimators, or laboratory technicians. Experienced graduates may achieve responsible supervisory and managerial positions.

Graduates may also continue their education by pursuing a Bachelor of Science degree in construction technology or in land surveying.

FRESHMAN YEAR

First Semester

(3) CET 104 (Elementary Surveying)
(2) ART 116 (Construction Drafting)
(2) ART 162 (Building Materials and Methods)
(5) MA 150 (Mathematics for Technology)*
(3) English†

(15)

Second Semester

(3) CET 108 (Route Surveying and Design)
(3) CET 160 (Statics)
(3) ART 150 (Architectural Construction I)
(3) MA 221 (Calculus for Technology I)
(3) COM 114 (Fundamentals of Speech Communication)

(15)

SOPHOMORE YEAR

Third Semester

(3) CET 209 (Land Surveying and Subdivision)
(3) CET 253 (Hydraulics and Drainage)
(3) CET 260 (Strength of Materials)
(2) ART 276 (Specifications and Contract Documents)
(4) PHYS 218 (General Physics)
(3) Social science elective

(18)

Fourth Semester

(3) CET 266 (Materials Testing)
(3) CNT 280 (Quantity Survey and Estimating)
(3) Structural elective
(3) Mathematics/Science elective
(3) Business elective
(3) Nontechnical elective

(18)

* See mathematics footnote, p. 9.
† ENGL 100, 104, or 101 and 185 or 286.

COMPUTER TECHNOLOGY

Offered at: Calumet, Fort Wayne, Indianapolis, and North Central.

This two-year associate degree program is designed to produce a graduate competent in computer programming in either the commercial or technical area, depending on which of the two options is selected. It prepares a person to perform the following functions: analyze problems, design flowcharts, write computer programs, verify programs, and evaluate and modify existing programs. It also familiarizes him with procedures common in his area of specialization.

Graduates may continue their education by pursuing a Bachelor of Science degree with a major in computer technology.

FRESHMAN YEAR

First Semester

(5) CPT 115 (Introduction to Data Processing)
(3) COM 114 (Fundamentals of Speech Communication)
(1) ENGL 185 (Developmental Reading)
(3) IET 104 (Industrial Organization)
(5) MA 150 (Mathematics for Technology)*

(17)

Second Semester

(3) CPT 122 (Computer Mathematics)
(3) CPT 131 (Assembly Language Programming I)
(2) ENGL 101 (English Composition I)
(6) Option courses
(3) Elective

(17)

SOPHOMORE YEAR

Third Semester

(3) CPT 132 (Assembly Language Programming II)
(3) CPT 225 (Statistical Methods)
(3) CPT 264 (FORTRAN Programming)
(6) Option courses

(15)

Fourth Semester

(3) CPT 261 (RPG Programming)
or
CPT 286 (Computer Operating Systems I)
(1) CPT 294 (Computer Seminar)
(3) ECON 210 (Principles of Economics)
(3) ENGL 220 (Technical Report Writing)
(6) Option courses

(16)

Commercial Option

(3) INDM 200 (Introductory Accounting)
(3) INDM 201 (Cost Accounting)
(3) CPT 254 (Commercial Systems Applications)
(3) CPT 265 (COBOL Programming)
(6) Electives

Technical Option

(3) MA 221 (Calculus for Technology I)
(3) MA 222 (Calculus for Technology II)
(6) Laboratory science electives†
(3) CPT 220 (Numerical Methods I)
(3) Elective

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* See mathematics footnote, p. 9.

† Laboratory science electives must be a two-semester sequence.

ELECTRICAL ENGINEERING TECHNOLOGY

Offered at: All campuses.

ECPD accredited at Calumet, Fort Wayne, and West Lafayette campuses, and at IUPUI.

The electrical engineering technology program is a combination of courses in electricity, electronics, mathematics, science, and general academic areas that leads to the degree of Associate of Applied Science. The program is designed to prepare students for employment as technicians in research laboratories, electronic industries, and in any industry that uses electrical power or electronic controls.

The basic curriculum will provide the student with sufficient education to find employment in the fields of communications electronics, industrial electronics, microwaves, military electronics, computer electronics, automation, electronic servicing, television, electrical power, aviation electronics, and others. Specialization in these areas is provided by technical elective courses in the second year of the program.

Students who obtain the degree of Associate in Applied Science are eligible for consideration for admission to curricula leading to the degree of Bachelor of Science. Approximately two additional years of study are necessary to complete the requirements for this degree.

Graduates of the associate degree program in electrical engineering technology are eligible for certification as Associate Engineering Technicians.

FRESHMAN YEAR

First Semester

(2) EET 103 (Electronics I)
(3) EET 101 (Electrical Circuits I)
(2) EET 113 (EET Laboratory I)
(5) MA 150 (Mathematics for Technology)*
(2) ENGL 101 (English Composition I)
(1) ENGL 185 (Developmental Reading)
(3) Nontechnical elective

(18)

Second Semester

(3) EET 153 (Electronics II)
(3) EET 151 (Electrical Circuits II)
(2) EET 163 (EET Laboratory II)
(4) PHYS 218 (General Physics)
(3) MA 221 (Calculus for Technology I)
(3) COM 114 (Fundamentals of Speech Communication)

(18)

SOPHOMORE YEAR

Third Semester

(3) EET 203 (Electronics III)
(3) EET 211 (Electrical Power and Machinery)
(2) EET 213 (EET Laboratory III)
(3) MA 222 (Calculus for Technology II)
(3) Technical elective
(4) PHYS 219 (General Physics)

(18)

Fourth Semester

(3) EET 253 (Electronics IV)
(1) EET 263 (EET Laboratory IV)
(3) EG 110 (Drafting Fundamentals)
(2) EET specialty laboratory
(3) Technical elective
(6) Nontechnical electives

(18)

* See mathematics footnote, p. 9.

TECHNICAL ELECTIVES*

Offered periodically depending upon student and local industrial needs.

EET 301, 302, 303, 306, 307, 321, 351, 352, 353, 354, 356, 361, 362, 363, 364, 366, 371, 372, 373, 374, 376, 381, 383, 386, 499.

* Refer to section on course description in back of catalog.

GENERAL AVIATION FLIGHT TECHNOLOGY

Offered at: West Lafayette.

The general aviation flight technology curriculum is an academically oriented progression of study directed toward training a student in primary, advanced, and instrument flight. This curriculum is integrated with two years of college general studies.

Application of the background gained in this technology can be made either in general aviation or in a variety of other fields where flight orientation is important to a successful career. This is an intensive, two-year undergraduate college program.

Prior to final acceptance into the general aviation flight technology curriculum, a student must present evidence that he has satisfactorily completed a Federal Aviation Administration second-class medical examination.

FRESHMAN YEAR

First Semester

(3) MA 153 (Algebra and Trigonometry I)
(2) ENGL 101 (English Composition I)
(3) GEOS 230 (Survey of Meteorology)
(2) AT 121 (Aircraft Piston Engines for Pilots)
(1) AT 143 (Private Flight)
(3) AT 144 (Private Pilot Lectures)

(14)

Second Semester

(3) MA 154 (Algebra and Trigonometry II)
(2) ENGL 102 (English Composition II)
(3) COM 114 (Fundamentals of Speech Communication)
(3) PSY 120 (Elementary Psychology)
(1) AT 148 (Commercial Flight I)
(3) AT 149 (Commercial Pilot Lectures I)

(15)

Summer Session*

(1) AT 243 (Commercial Flight II)
(2) AT 244 (Commercial Pilot Lectures II)

(3)

SOPHOMORE YEAR

Third Semester

(3-4) Physics selective
(3) ECON 210 (Principles of Economics)
(2) AT 241 (Aircraft Electricity for Flight Crew Members)
(1) AT 248 (Commercial Flight III)
(3) AT 249 (Commercial Pilot Lectures III)
(3) Humanities elective

(15-16)

Fourth Semester

(3-4) Physics selective
(3) ENGL 420 (Business Writing: General Applications)
(1) AT 253 (Instrument Flight)
(3) AT 254 (Instrument Lectures)
(3) INDM 200 (Introductory Accounting)
(3) Elective

(16-17)

* Persons entering in January with no flight experience must attend one summer session prior to entering the Professional Pilot Program.

PHYSICS SELECTIVES

(3) PHYS 210 (The Nature of Physical Science I)
(3) PHYS 211 (The Nature of Physical Science II)
(4) PHYS 218 (General Physics)
(4) PHYS 219 (General Physics)
(4) PHYS 220 (General Physics)
(4) PHYS 221 (General Physics)

INDUSTRIAL ENGINEERING TECHNOLOGY

Offered at: Calumet, Fort Wayne, Indianapolis, North Central*
ECPD accredited at Calumet campus and at IUPUI.

This field is designed to develop technicians to support the problem-solving and decision-making functions in management and to prepare for planning and control, work method analysis, work measurements, quality assurance and controls, and systems and procedures analysis. Practical applications of production-oriented operations, research techniques, data processing, and computer programming fundamentals are stressed. Because an industrial engineering technician is concerned with an organization which has human dimensions at least as important as the technical ones, this aspect is also stressed throughout the curriculum.

FRESHMAN YEAR

First Semester		Second Semester	
(3)	EG 110 (Drafting Fundamentals)	(3)	English‡
(3)	IET 104 (Industrial Organization)	(3)	IET 204 (Techniques of Maintaining Quality)§
(5)	MA 150 (Mathematics for Technology)†	(3)	CPT 200 (Computer Programming Fundamentals)
(1)	MET 100 (Applied Engineering Computations)	(3)	STAT 401 (Elementary Statistical Methods)
(4)	PHYS 218 (General Physics)	(2)	MET 335 (Basic Machining)
		(4)	PHYS 219 (General Physics)
(16)		(18)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(3)	ECON 210 (Principles of Economics)	(3)	GNT 220 (Technical Report Writing)
(3)	IET 224 (Production Planning and Control)	(3)	IET 250 (Fundamentals of Production Cost Analysis)
(3)	IET 262 (Motion Study and Work Methods)§	(3)	IET 266 (Work Measurement and Incentives)§
(3)	IS 252 (Human Relations in Industry)	(3)	COM 114 (Fundamentals of Speech Communication)
(2)	IET 220 (Critical Path Analysis)	(4-6)	Technical electives
(3)	Technical electives		
(17)		(16-18)	

TECHNICAL ELECTIVES

Methods Improvement Option: IET 120, 272, 296.
Materials Handling Option: IET 268, 296, 312.
Quality Control Option: STAT 402; IET 354, 364.
Production Option: IET 296, 323, 324.
Supervision Option: IS 240, 331, 374.

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* Also offered at Indiana University-Eastern at Richmond.

† See mathematics footnote, p. 9.

‡ Students will be counseled into ENGL 101 and 286, 100, 103, or 104, depending on the individual student's needs.

§ North Central students will take these courses at Calumet.

INDUSTRIAL ILLUSTRATION TECHNOLOGY

Offered at: West Lafayette.

This curriculum is designed to prepare students as technical illustrators who will be competent in designing and producing the finished art work necessary for brochures, charts, catalogs, instruction booklets, posters, and other publications of modern industry. At the same time they will have gained the additional skills of a draftsman and be technically prepared for advancement.

Graduates are prepared to accept positions in the sales divisions of industrial organizations, in governmental agencies, in certain phases of printing, advertising and display, as well as in drafting rooms of manufacturing companies. Some openings are also available in television and allied entertainment fields. The aggressive graduate should be able to operate on a free-lance basis after two or three years of practical experience.

FRESHMAN YEAR

First Semester

(3) EG 110 (Drafting Fundamentals)
(3) EG 112 (Layout, Lettering, and Typography)
(2) EG 213 (Freehand Drawing)
(2) ENGL 101 (English Composition I)
(3) MA 153 (Algebra and Trigonometry I)
(2) MET 180 (Materials and Processes)

(15)

Second Semester

(3) EG 111 (Advanced Drafting)
(2) EG 210 (Industrial Sketching)
(3) EG 212 (Descriptive Geometry)
(2) ENGL 102 (English Composition II)
(3) MA 154 (Algebra and Trigonometry II)
(2) MET 335 (Basic Machining)

(15)

SOPHOMORE YEAR

Third Semester

(3) EG 311 (Industrial Arts Design)
(2) EG 315 (Graphical Presentation of Data)
(3) EG 317 (Production Illustration)
(3) IET 104 (Industrial Organization)
(4) PHYS 205 (Physics for Agricultural Students)
(3) SOC 100 (Introductory Sociology) or
COM 114 (Fundamentals of Speech Communication)

(18)

Fourth Semester

(3) ECON 210 (Principles of Economics)
(3) EG 312 (Shades, Shadows, and Perspective)
(3) EG 318 (Project in Technical Illustration)
(3) EG 319 (Basic Product Design) or
A&D 375 (Sculpture)
(3) IED 225 (Graphics of Communication)
(3) IS 252 (Human Relations in Industry)

(18)

MECHANICAL DRAFTING DESIGN TECHNOLOGY

Offered at: Calumet, Fort Wayne, Indianapolis.*

This program is intended to prepare senior draftsmen and junior design draftsmen for employment in manufacturing and construction industries, government, utilities, and other service firms. In addition, graduates will be prepared to make industrial illustrations for parts manuals, brochures, proposals, and assembly instructions.

Mechanical drafting design technology concerns matters such as the preparation of sketches and drawings for design proposals, experimental models, prototype configurations, and production parts and assemblies.

Graduates of this program may perform drafting design functions such as the development of the design of a sub-assembly or major component under the direction of an engineer or an engineering technologist.

With additional experience, promotion to checker, designer, or drafting supervisor is possible. Also, this program is sufficiently broad to allow for progression into a variety of other technical or supervisory positions.

FRESHMAN YEAR

First Semester

(1) MET 100 (Applied Engineering Computations)
(2) MET 180 (Materials and Processes)
(3) EG 110 (Drafting Fundamentals)
(3) ENGL 104 (English Composition I)
(3) MA 111 (Algebra)
(3) CPT 100 (Computer Utilization)

(15)

Second Semester

(2) MET 256 (Materials Fabrication)
(2) MET 204 (Production Drawing)
(3) MET 112 (Applied Mechanisms)
(3) MET 156 (Graphical Computations)
(3) MA 112 (Trigonometry)
(3) COM 114 (Fundamentals of Speech Communication)

(16)

SOPHOMORE YEAR

Third Semester

(4) MET 212 (Mechanics of Materials)
(2) MET 236 (Jig and Fixture Design)
(3) MET 330 (Introduction to Fluid Power)
(3) EG 317 (Production Illustration)
(4) GNT 136 (Physics: Mechanics and Heat)

(16)

Fourth Semester

(2) MET 288 (Die Design)
(3) MET 299 (Mechanical Engineering Technology)
(3) IET 204 (Techniques of Maintaining Quality)
(4) GNT 176 (Physics: Electricity, Sound, and Light)
(3) Elective

(15)

* Also offered at Indiana University-Southeastern at Jeffersonville.

MECHANICAL ENGINEERING TECHNOLOGY

Offered at: All campuses.*

ECPD accredited at Calumet and West Lafayette campuses, and at IUPUI.

This program is intended to prepare specialists in the development of machines and products, in production processes, in the installation and maintenance of machines, and in solving repetitive engineering problems.

Mechanical engineering technology concerns the generation, transmission, and utilization of mechanical and fluid energy and the design and production of tools and machines and their products.

Graduates of the program accept jobs as laboratory technicians, engineering aides, plant maintenance men, layout men, production assistants, and technical salesmen. With additional experience, promotion to positions such as industrial supervisors, machine and tool designers, technical buyers, production expeditors, and cost estimators is possible.

Co-op work programs with industry may be made available to students on an individual basis.

Graduates of the associate degree program in mechanical engineering technology are eligible for certification as associate engineering technicians.

FRESHMAN YEAR

First Semester		Second Semester	
(1)	MET 100 (Applied Engineering Computations)	(2)	MET 204 (Production Drawing)
(2)	MET 180 (Materials and Processes)	(4)	MET 211 (Applied Strength of Materials)
(2)	MET 210 (Applied Statics)	(2)	MET 335 (Basic Machining)‡
(3)	EG 110 (Drafting Fundamentals)	(3)	GNT 220 (Technical Report Writing)
(2)	ENGL 101 (English Composition I)	(3)	MA 223 (Calculus for Technology I)
(5)	MA 150 (Mathematics for Technology)†	(3)	COM 114 (Fundamentals of Speech Communication)
(1)	ENGL 185 (Developmental Reading)		
(16)		(17)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(3)	MET 200 (Power Systems)	(3)	MET 330 (Introduction to Fluid Power)‡
(4)	MET 216 (Machine Elements)	(3)	IS 252 (Human Relations in Industry)
(3)	MA 222 (Calculus for Technology II)	(4)	PHYS 221 (General Physics)
(4)	PHYS 220 (General Physics)	(3)	Technical elective
(3)	Technical elective	(3)	Nontechnical elective
(17)		(16)	

* Also offered at Indiana University-Eastern at Richmond.

† See mathematics footnote, p. 9.

‡ North Central students will take these courses at Calumet.

MENTAL HEALTH TECHNOLOGY

Offered at: Fort Wayne.

This program provides a new entry for those interested in working in the field of mental health. The curriculum is a combination of general education, specialized courses in areas directly related to mental health, and supervised experience in mental hospitals, clinics, homes for the retarded, and other community mental health settings.

The two years of intensive study and work are designed to develop both a basic understanding of the field and desirable attitudes and skills in persons who will work closely with the emotionally disturbed and/or retarded.

Graduates will work with professionals in the mental health field to help organize and carry out a variety of treatment programs, such as activities programs, educational programs, group therapy, work therapy, and others.

This program could also provide a stepping-stone for students who become interested in more advanced degrees in one of the mental health professions.

FRESHMAN YEAR

Presession

(1) MHT 121 (Workshop in Interpersonal Relations)

First Semester

(5) MHT 100 (Introduction to Mental Health)
(2) MHT 110 (Personal Growth and Interpersonal Skills)
(2) BIOL 201 (Biology of Man)
(1) BIOL 202 (Laboratory in Human Biology)
(3) ENGL 104 (English Composition I)
(3) PSY 120 (Elementary Psychology)

(16)

Second Semester

(2) MHT 111 (Personal Growth and the Helping Relationship)
(5) MHT 200 (Activity Therapies)
(2) BIOL 203 (Biology of Man)
(1) BIOL 204 (Laboratory in Human Biology)
(3) PSY 235 (Child Psychology)
(3) SOC 100 (Introductory Sociology)

(16)

Summer Session

(Special Extended Period)

(1) MHT 205 (Practicum in Mental Health)

SOPHOMORE YEAR

Third Semester

(5) MHT 201 (Behavior Modification)
(2) MHT 210 (Human Relations and Group Dynamics)
(3) PSY 350 (Abnormal Psychology)
(3) SOC 220 (Social Problems)
(3) Guided elective

(16)

Fourth Semester

(2) MHT 211 (The Individual, Social Systems and the Dynamics of Change)
(5) MHT 251 (The Case Study Method)
(3) MHT 298 (Seminar in Mental Health)
(3) PSY 340 (General Social Psychology)
(3) Guided elective

(16)

METALLURGICAL ENGINEERING TECHNOLOGY

Offered at: Calumet.

This curriculum is provided for high school graduates who are interested in following a career in a field which is fundamental to all achievements in engineering in our metals oriented civilization. The scarcity of trained technicians to assist senior engineers and scientists in the development of new materials and the modification of old ones to new applications has afforded graduates of this course unusual opportunities for growth and advancement. While directly concerned with metallic materials, basic concepts applicable to other engineering materials such as plastics and ceramics are part of the subject matter covered in this course.

The curriculum includes instruction in mathematics, physics, and chemistry which are basic to the courses in metallurgy. The latter are oriented toward giving the student a grasp of the physical and chemical bases for the behavior and properties of metals and alloys. Courses in humanities are included to enhance the broader educational aspects of this training.

Metallurgical engineering technology prepares students for employment in steel mills, metal processing and fabricating plants, and the technical servicing of these products along the line of distribution to the ultimate consumer.

FRESHMAN YEAR

First Semester		Second Semester	
(4)	CHM 109 (General Chemistry)	(4)	CHT 212 (Industrial Chemistry: Qualitative)
(2)	MTT 280 (Nonferrous Metallurgy)	(3)	MTT 184 (Ferrous Metallurgy)
(3)	ENGL 104 (English Composition I)	(3)	EG 110 (Drafting Fundamentals)
(5)	MA 150 (Mathematics for Technology)*	(3)	MA 221 (Calculus for Technology I)
(4)	GNT 136 (Physics: Mechanics and Heat)	(4)	GNT 176 (Physics: Electricity, Sound, and Light)
(18)		(17)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(4)	MTT 228 (Physical Metallurgy)	(4)	MTT 229 (Physical Metallurgy II)
(4)	CHT 252 (Industrial Chemistry: Quantitative)	(3)	MTT 284 (Metallography)
(3)	MTT 240 (Heat Transfer and Thermodynamics)	(3)	CPT 300 (Computer Utilization)
(3)	MA 222 (Calculus for Technology II)	(3)	ECON 210 (Principles of Economics)
(3)	COM 114 (Fundamentals of Speech Communication)	(3)	GNT 220 (Technical Report Writing)
		(3)	IS 252 (Human Relations in Industry)
(17)		(19)	

* See mathematics footnote, p. 9.

NURSING

Offered at: Calumet, Fort Wayne, North Central, West Lafayette.
Accredited by the National League for Nursing at all campuses.

This program of nursing education provides a means of correlating the philosophy and standards of nursing education with those of general education. The over-all standards and policies of the University apply to the program in nursing as they do to the other educational programs within the University.

The associate degree program is designed to fulfill the educational needs of qualified high school graduates who want to prepare for nursing in a relatively short time and study in a multi-purpose collegiate institution where they share the responsibilities, privileges, and intellectual and social experiences with all other students. Clinical practice experiences are obtained in nearby cooperating hospitals. The University nursing faculty selects, guides, and evaluates learning experiences.

Graduates are prepared to give care to patients as beginning general duty nurses, drawing upon their scientific knowledge and understanding of human behavior and needs. They are prepared to develop satisfactory relationships with people, to cooperate and share responsibility for their patients' welfare with other members of the nursing and health staff, and to be self-directive in learning from experience as practicing nurses.

Graduates of the associate degree program in nursing are eligible for state examination for licensure as registered nurses.

All nursing courses must be taken in sequence.

FRESHMAN YEAR

First Semester

(3)	BIOL 203 (Biology of Man)
(3)	CHM 107 (General Chemistry) or CHM 119 (General Chemistry)
(3)	PSY 120 (Elementary Psychology)
(2)	ENGL 101 (English Composition I)*
(6)	NT 115 Nursing I (Introduction to Nursing)
(17)	

Second Semester

(3)	BIOL 204 (Biology of Man)
(3)	CHM 118 (General Chemistry)†
(2)	ENGL 102 (English Composition II)*
(3)	PCOL 201 (Introductory Pharmacology)
(6)	NT 116 Nursing II (Medical-Surgical Nursing of Adults and Children)
(17)	

SOPHOMORE YEAR

Third Semester

(3)	BIOL 220 (Introduction to Microbiology)
(3)	F&N 303 (Essentials of Nutrition)
(10)	NT 224 Nursing III (Medical-Surgical Nursing of Adults and Children)
(16)	

Fourth Semester

(3)	NT 280 (Issues in Nursing)
(5)	NT 225 (Maternal Child Health Nursing)
(5)	NT 240 (Psychiatric Mental Health Nursing)
(3)	SOC 100 (Introductory Sociology)
(16)	

* Required at West Lafayette. ENGL 104 is required at the Calumet, Fort Wayne, and North Central campuses.

† CHM 118 required at West Lafayette Campus only.

PROFESSIONAL FOREMEN

Offered at: West Lafayette.

This program is designed to meet the needs of individuals who wish to improve their skills as first-line supervisors as well as their general educational base. The program is limited to people who are employed in a foreman position. To be admitted to the program, an applicant must produce a letter written by his employer to substantiate that he is a foreman.

Recognizing there are many different types of industries and different foremanship needs, a student's program is planned jointly by the individual, a representative of his firm, and an academic adviser.

The curriculum is college level, culminating in the awarding of the Associate in Applied Science degree. Graduates of the program are eligible to continue toward a Bachelor of Science degree in industrial supervision.

General Plan of Study

CORE

Course Number	Course Description	Credit Hours
IS 252	(Human Relations in Industry)	3
IS 331	(Industrial Safety)	2
IET 104	(Industrial Organization)	3
IS 374	(Industrial Supervision)	3
	Total	11

COMMUNICATIONS AREA

English composition or speech	3
Any area in communications	3
Total	6

FUNCTIONAL AREA

Recognizing that foremen work in various functional areas, each foreman will be expected to select one or more groups of courses that are designed to increase his effectiveness on the job. The following are examples of existing functional areas.

Quality Control
Methods Improvement
Materials Handling
Production Planning
Personnel Relations
Labor Relations

Mechanical Technology
Chemical-Antibiotic Industry
Electrical Utilities
Electrical In-Plant Distribution
Bakery Laboratory Technology

Total 15 credit hours

SUPPORTIVE AREA

Each foreman should have a balanced educational experience. Therefore, he should take certain technical and nontechnical courses. Some of the more typical courses considered applicable are listed on the following page.

Nontechnical

INDM	200	(Accounting)
INDM	201	(Cost Accounting)
SOC	100	(Introductory Sociology)
PSY	120	(Elementary Psychology)
GNT	220	(Technical Report Writing)
ECON	210	(Principles of Economics)
IS	375	(Basic Methods of Industrial Training)
IS	365	(Personnel Problems in Industry)
IET	250	(Fundamentals of Production Cost Analysis)

Requirements 12-18 credit hours

Technical

MA	150	(Algebra and Trigonometry)
CHM	111	(General Chemistry)
and	112	
PHYS	218	(General Physics)
and	219	
MET	100	(Applied Engineering Calculations)

Engineering and technology courses to be selected on the basis of the individual's career objectives and qualifications

Requirements 12-18 credit hours

Grand Total 62 credit hours

BACHELOR OF SCIENCE DEGREE FOR ASSOCIATE DEGREE GRADUATES

The Bachelor of Science degree awarded under the School of Technology's "2 + 2" education plan is unique. A student following this plan earns first an associate degree in two years and then a Bachelor of Science degree in two more years.

A student is awarded an Associate in Applied Science degree upon successful completion of the two-year program. The associate degree signifies that the recipient is educated at the technician's level and is "job-ready." Thus, individuals may go directly into well-paying jobs, or they may elect to continue study.

A student who desires to continue his formal education may be admitted to a two-year "add-on" technologist's program. A student who successfully completes this program is awarded a Bachelor of Science degree. This provides the background for increased job responsibility. Eight options are available to qualified students.

Options

Computer—for graduates of the computer technology associate degree program. (See page 47.)

Construction—for graduates of architectural technology or civil engineering technology associate degree programs. (See page 48.)

Electrical—for graduates of the electrical engineering technology associate degree program. (See page 49.)

Industrial—for graduates of the industrial engineering technology associate degree program. (See page 50.)

Mechanical—for graduates of the mechanical engineering technology associate degree program. (See page 51.)

Nursing—for graduates of nursing associate degree programs or those holding diplomas in nursing. (See page 52.)

Professional Pilot Technology—for graduates of the general flight technology associate degree program. (See page 53.)

Technology Teaching—for graduates of any technical associate degree program. (See page 55.)

Admission Requirements

Applicants for admission to any of these options must have earned an associate degree or equivalent in one of the technologies. Transfer students will be admitted to Purdue University according to standard procedures.

Graduation Requirements

The technician who pursues a Bachelor of Science degree will follow a plan of study which includes a minimum of 67 semester credit hours beyond the associate degree. Students transferring from other institutions must complete at least 32 semester credit hours of course work in residence in the third and fourth year of the Bachelor of Science degree program.

BACHELOR OF SCIENCE DEGREE
COMPUTER TECHNOLOGY

Offered at: Indianapolis.

This baccalaureate program is a two-year "add-on" curriculum which is open to associate degree graduates of computer technology, either commercial or technical option.

The program builds on the student's knowledge of computer programming acquired in the first two years and emphasizes the practical aspects of computer systems design and commercial systems analysis. The inclusion of many elective courses enables the students to pursue areas of special interest.

Graduates are prepared to fill a variety of positions related to data processing, computer systems, and computer programming.

JUNIOR YEAR*

Fifth Semester

(3)	CPT 340 (Data Communications)
(6)	Computer concentration
(3)	MA 221 (Calculus for Technology I)†
(3)	Communication elective
(2)	Elective
(17)	

Sixth Semester

(3)	CPT 360 (PL/1 Programming)
(3)	Computer concentration
(3)	MA 222 (Calculus for Technology II)†
(4)	Physical science elective†
(3)	Elective
(16)	

SENIOR YEAR

Seventh Semester

(6)	Computer concentration
(4)	Physical science elective†
(3)	Social science elective
(3)	Humanities elective
(16)	

Eighth Semester

(6)	Computer concentration
(3)	Social science elective
(3)	Humanities elective
(4)	Electives
(16)	

COMPUTER CONCENTRATION

Any two of the following sequences plus one additional computer-oriented course make up the computer concentration.

Commercial systems: CPT 354, 454; INDM 300
Computer systems analysis: CPT 380, 480; CS 542
Systems programming: CPT 386, 486; CS 402
Technical systems: CPT 320, 364, 444

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* Freshman and sophomore years on p. 32.
† Technical option graduates substitute following sequence:
CPT 265 (COBOL Programming)
Business electives (2)
Elective

BACHELOR OF SCIENCE DEGREE
CONSTRUCTION TECHNOLOGY

Offered at: Calumet, Indianapolis, West Lafayette.*

ECPD accredited at Calumet Campus.

This baccalaureate program is open to students with an associate degree in architectural technology, civil engineering technology, or the equivalent. It emphasizes the principles and practices of construction and the basics of management. Technical electives permit students to orient their program toward a specific segment of the construction industry.

Graduates of the program find employment with contractors, building materials companies, utilities, architects, engineers, and governmental agencies. Their work may be in the field or in an office. Many graduates will ultimately become owners or managers of construction firms.

This curriculum prepares students for registration as professional constructors, but not as professional architects or engineers.

JUNIOR YEAR†

Fifth Semester		Sixth Semester	
(3)	CNT 344 (Construction Inspection)	(2)	CNT 340 (Construction Scheduling)
(6)	Technical electives (2)	(6)	Technical electives (2)
(3)	CPT 200 (Computer Programming Fundamentals)	(3)	Business elective
(3)	Communications elective	(3)	Communication elective
(3)	Elective	(3)	Elective
(18)		(17)	

Summer Session

(1) CNT 390 (Construction Work Experience)

SENIOR YEAR

Seventh Semester		Eighth Semester	
(4)	CNT 441 (Construction Operations)	(3)	CNT 442 (Construction Costs and Bidding)
(3)	Technical elective	(3)	Technical elective
(3)	Business elective	(3)	Business elective
(3)	Nontechnical elective	(3)	Nontechnical elective
(3)	Elective	(3)	Elective
(16)		(15)	

* Limited program at Fort Wayne.

† Freshman and sophomore years on p. 25 or 31.

BACHELOR OF SCIENCE DEGREE
ELECTRICAL TECHNOLOGY

Offered at: Calumet, Fort Wayne, Indianapolis, West Lafayette.
ECPD accredited at IUPUI and at West Lafayette Campus.

The student who completes the plan of study and receives the degree of Associate in Applied Science is eligible to enter the following Bachelor of Science program. This B.S. degree program prepares the student for positions as technologists in manufacturing industries. The plan provides additional study in electrical engineering technology and courses that provide the background of related technical and nontechnical topics which are essential in modern industry.

General Plan of Study

SCIENCE (6 credit hours)
Chemistry, mathematics, biology, geoscience, physics

INTERDISCIPLINARY (17 credit hours)
Required (17 credit hours)
Computer programming, thermodynamics, statics, and strength of materials
Elective (5 credit hours)
Nuclear, construction, manufacturing, computer, education

SPECIALIZED TECHNOLOGY (15 credit hours)
Required (6 credit hours)
(3) EET 383 (Advanced Electrical Networks)
(3) EET 499 (Senior Design Project)
Elective (9 credit hours)
(3) EET 302 (Electro-Mechanical Control Components)
(3) EET 303 (Communications I)
(3) EET 306 (Television I)
(3) EET 307 (Pulse Circuits)
(3) EET 321 (Generation and Transmission of Electrical Power)
(3) EET 352 (Electronics Applications)
(3) EET 366 (Transistors and Semiconductor Devices)
(2) EET 376 (Electronic Troubleshooting Laboratory)
(3) EET 353 (Communications II)
(3) EET 462 (Automatic Control Systems)

SUPERVISION TECHNOLOGY (11 credit hours)
Required (6 credit hours)
Economics and industrial supervision
Elective (5 credit hours)
Business, cost analysis, industrial supervision, industrial management

GENERAL EDUCATION (18 credit hours)
Required (12 credit hours)
English (6 credit hours), communications (6)
Nontechnical Elective (6 credit hours)
From School of Humanities, Social Science, and Education

BACHELOR OF SCIENCE DEGREE
INDUSTRIAL ENGINEERING TECHNOLOGY

Offered at: Calumet, Fort Wayne, Indianapolis.
ECPD accredited at Calumet Campus and at IUPUI.

The plan of study provides for the broadening of the industrial engineering technology associate degree graduate in communications, interpersonal relations, supervision techniques, and associated technical areas.

This baccalaureate program prepares graduates to fill technical positions in industrial engineering departments of manufacturing and production industries.

Utilizing the relevant procedures and standards established by industrial engineers, the industrial engineering technologists thus will implement the systems designed by the industrial engineer.

JUNIOR YEAR*

Fifth Semester

(3) MA 221 (Calculus for Technology I)
(3) IET 312 (Materials Handling)
(3) MET 384 (Instrumentation)
(3) EET 216 (Electrical Machines and Controls)
(1) ENGL 185 (Developmental Reading)
(3) English elective
(2) IS 331 (Industrial Safety)

(18)

Sixth Semester

(3) MA 222 (Calculus for Technology II)
(3) IET 301 (Cost Evaluation and Control)
(2) MET 380 (Materials and Processes)
(3) MET 330 (Introduction to Fluid Power)
(3) IS 368 (Legislation Affecting Industrial Relations)
(3) ENGL 421 (Business Writing: Engineering Applications)

(17)

SENIOR YEAR

Seventh Semester

(2) IET 354 (Attribute and Variable Sampling)
(3) MET 400 (Power Systems)
(4) MET 412 (Mechanics of Materials)
(3) IS 356 (Personal Problems)
(3) COM 315 (Speech Communication of Technological Information)
(3) General education elective

(18)

Eighth Semester

(3) IET 364 (Total Quality Control)
(3) IET 497 (Senior Project)
(3) COM 415 (Discussion of Technical Problems)
(3) IS 374 (Industrial Supervision)
(3) General education elective

(15)

* Freshman and sophomore years on p. 37.

BACHELOR OF SCIENCE DEGREE
MECHANICAL TECHNOLOGY

Offered at: Calumet, Fort Wayne, Indianapolis, West Lafayette.

ECPD accredited at Calumet and West Lafayette campuses, and at IUPUI.

Graduates of the two-year mechanical engineering technology program are eligible for admission to this two-year "add-on" curriculum.

This baccalaureate program prepares graduates to fill technical positions in manufacturing and production industries such as production supervisor, plant engineer, and tool engineer technologist.

Technologists who have a detailed knowledge of the practices, procedures, and codes established by engineers become key employees. This is because they are trained to transform a device or system from a concept originated by an engineer to a reality.

The plan of study provides for the broadening of the associate degree graduate in communications, interpersonal relations, supervision techniques, and associated technical areas.

JUNIOR YEAR*

Fifth Semester

(3) CPT 200 (Computer Programming Fundamentals)
(3) ECON 210 (Principles of Economics)
(3) EET 216 (Electrical Machines and Controls)
(3) ENGL 421 (Business Writing: Engineering Applications)
(3) Interdisciplinary elective
(3) Mechanical engineering technology elective

(18)

Sixth Semester

(3) IET 250 (Fundamentals of Production Cost Analysis)
(3) Interdisciplinary elective
(3) Interdisciplinary elective
(3) IS 374 (Industrial Supervision)
(3) Mechanical engineering technology elective

(15)

SENIOR YEAR

Seventh Semester

(3) COM 315 (Speech Communication of Technical Information)
(3) English elective
(3) Humanities elective
(3) Interdisciplinary elective
(3) Mechanical engineering technology elective
(3) STAT 401 (Elementary Statistical Methods)

(18)

Eighth Semester

(3) COM 415 (Discussion of Technical Problems)
(3) Humanities elective
(3) Interdisciplinary elective
(3) MET 497 (Senior Project)
(3) Mechanical engineering technology elective
(3) Supervision elective

(18)

* Freshman and sophomore years on p. 40.

BACHELOR OF SCIENCE DEGREE NURSING*

Offered at: Calumet, West Lafayette.

The baccalaureate degree program is designed to prepare registered nurses for first level leadership positions in nursing through an upper division, undergraduate curriculum in nursing leading to the Bachelor of Science degree. It is primarily for graduates of two-year college-level associate degree programs in nursing who have changed their career objectives.

Graduates of the program are qualified for leadership roles in such areas as community health nursing, school nursing, industrial nursing, and similar fields, as well as in hospitals.

All nursing courses must be taken in sequence.

JUNIOR YEAR

Fifth Semester

(3) COM 114 (Fundamentals of Speech Communication)
(3) BCHM 100 (Introduction to Biochemistry)
(3) BIOL 301 (Anatomy and Physiology)
(3) PSY 340 (General Social Psychology) or
SOC 350 (Marriage and Family Relationships)
(5) NT 310 (Family and Community Nursing I)

(17)

Sixth Semester

(3) COM 320† (Group Discussion and Conference Leadership)
(3) BIOL 302 (Anatomy and Physiology)
(3) PSY 311 (Motivation and Learning)
(3) EET 415 (Medical Electronics)
(5) NT 320 (Family and Community Nursing II)

(17)

SENIOR YEAR

Seventh Semester

(3) ENGL (English composition course)
(3) INDM 430 (Labor Relations)
(3) Elective
(3) Elective
(5) NT 410 (Nursing Leadership)

(17)

Eighth Semester

(3) PSY 500 (Statistical Methods Applied to Psychology, Education, and Sociology)
(3) CPT 300 (Introduction to Computers)
(3) Elective
(3) Elective
(5) NT 420 (Nursing Management)

(17)

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* A minimum of 45 semester hours must be at the 300-course-level or higher.
† Other communication courses may be substituted.

BACHELOR OF SCIENCE DEGREE FOR PROFESSIONAL PILOTS

Offered at: West Lafayette.

The professional pilot technology curriculum provides two years of advanced, airline-oriented training for selected graduates of the two-year general aviation flight technology curriculum. This program familiarizes the student with larger, higher performance aircraft and allows him to continue with both aviation and nonaviation general studies toward the Bachelor of Science program.

A very limited number of persons, other than graduates of general aviation flight technology, who comply with the proper academic and flight experience requirements may be admitted with advanced standing on a space-available basis.

This program of studies combines regular classroom activities with both reciprocating engine and jet synthetic flight trainers and multi-engine jet and reciprocating engine powered transport simulators.

This curriculum is designed to provide the student with the technical knowledge and background necessary to qualify him to apply for a position as a flight crew member with an air carrier or as an executive pilot or copilot.

Applicants must have satisfactorily passed a first class medical examination administered by a physician approved by the Federal Aviation Administration.

JUNIOR YEAR*

Fifth Semester

(3) AT 321 (Airways Procedures I)
(1) AT 325 (Airline Organization)
(2) AT 329 (Multi-Engine Aircraft Systems and Operations)
(1) AT 353 (Multi-Engine Flight)
(3) Industrial management elective
(2-3) Science elective
(3) Elective

(15-16)

Sixth Semester

(3) AT 320 (Aeronautics)
(3) AT 322 (Airways Procedures II)
(2) AT 354 (Supervised Flight Operations I)
(3) AT 355 (Transport Aircraft Systems and Operations I)
(3) AT 360 (Aircraft Gas Turbine Engines for Flight Crew Members)
(2-3) Science elective

(16-17)

Summer Session

(2) AT 420 (Aircraft Procedures I)
(3) AT 424 (Transport Aircraft Systems and Operations II)
(1) AT 431 (Supervised Flight Operations II)

(6)

* Freshman and sophomore years on p. 35.

SENIOR YEAR

Seventh Semester		Eighth Semester	
(2)	AT 421 (Aircraft Procedures II)	(2)	AT 410 (Airline Transport Procedures)
(3)	AT 426 (Transport Aircraft Systems and Operations III)	(2)	AT 422 (Aircraft Procedures III)
(3)	AT 429 (Advanced Navigation)	(3)	INDM 480 (Elements of Industrial Management)
(3)	Elective	(3)	Elective
(3)	Elective	(3)	Elective
(3)	Elective	(3)	Elective
(17)		(16)	

DEPARTMENT OF INDUSTRIAL EDUCATION

The Department of Industrial Education consists of two sections: industrial arts and vocational-technical. Each section is concerned with one or more programs and activities designed to equip men and women for entrance into career fields that require an intellectual base upon which practical applications of the knowledge gained in the humanities, the sciences, and the technologies depend. Thus, the courses provided offer a combination of theoretical and practical education.

Graduate and undergraduate programs which prepare students for entrance into a variety of careers in education, government, and industry are available. Students may elect to pursue a major which will lead to the degree of Bachelor of Science in Industrial Education with a specialty in one of the following areas:

1. Industrial arts teaching
2. Technology teaching
3. Vocational-industrial teaching

The Nature of Industrial Education

Industrial education prepares people for work and living in the industrial society. Public schools offer instruction in this field under the general classifications of industrial arts and vocational-industrial education. Vocational-technical schools offer industrial education opportunity with emphasis on occupational preparation. Industry, business, and government have become involved in and committed to programs of industrial education and training.

Industrial Arts Teaching

Industrial arts, as a subject in public schools, deals with industrial aspects of our culture, emphasizing tools, materials, processes, and products of contemporary American industry. Problems of industrial production, planning, and marketing are considered from the viewpoints of labor, management, and the consumer. Social problems related to industrial production and to technological change are integral parts of the subject matter of industrial arts. A part of the formal program of general education, industrial arts is most often included in the junior and senior high school curricula.

Excellent employment opportunities have been consistently available to Purdue graduates in industrial arts teaching. The demand for industrial arts teachers continues to exceed the number of qualified graduates.

Technology Teaching

The scientific and technological revolutions currently underway have created an increasing number of new engineering-related occupations in which the workers often are called technicians. The establishment and refinement of these occupations demand a kind of teacher who also is new to the scene. The Department of Industrial Education offers a major, technology teaching, designed to prepare students to become instructors of technical subjects in post-high school, industrial-technical curricula. Entry into this program of teacher education is based upon completion of a two-year college level, technical program leading to a degree comparable to Purdue's Associate in Applied Science.

Formal technical training, work experience, professional courses, general studies, and advanced technical preparation are considered necessary for teachers in technological specialties. The technology teaching major requires a balance of these components within a 131-semester-hour program of undergraduate study.

Vocational-Industrial Teaching

Vocational-industrial teaching, also known as trade and industrial teaching, is a part of the total Indiana program of vocational education. Vocational-industrial teachers must be occupationally competent in one of the many skilled and technical crafts found in industry in the United States. In order to qualify for the vocational teaching license, the student must have completed at least three years of work above the learner level in a craft, skilled trade, or some other type of industrial occupation, plus the general and professional education courses specified by the Teacher Training and Licensing Commission of the State Board of Education. The plan of study, when completed, qualifies the student for a provisional trade and industrial education teacher license.

A qualified graduate may find employment in day-trade vocational programs in a public high school, in an area vocational-technical center, or in one of a variety of institutions (including private) which are coming into prominence. He may serve as either a craft or occupational instructor or as a teacher of related subjects. He may, in addition, be called upon to teach apprentices or workers who attend part-time or evening-school classes. By completing one additional specified course he may be certified as a cooperative vocational education coordinator. Increasingly, demands are made upon the qualified vocational-industrial teacher to help adults to prepare themselves for work in occupations with which they are not familiar and in which there are shortages of trained workers.

Student Organizations

Two student organizations are associated with the Department of Industrial Education. Both the Mu Chapter of Iota Lambda Sigma and the Industrial Arts Education Club are affiliates of national organizations serving industrial education.

Iota Lambda Sigma, the honorary fraternity in industrial education, selects students for membership on the basis of scholastic achievement, character, and potential for leadership in industrial education. The fraternity membership includes college and university students in addition to persons engaged in teaching, research, supervision, and administration in some phase of industrial education.

Membership in the Industrial Arts Education Club is open to all students majoring in industrial arts teaching. Outside speakers, industrial tours, and discussion groups are arranged by the student leadership of the club to provide programs designed to help members broaden their understanding of industrial arts education.

Graduate Study in Industrial Education

Graduate programs in industrial education are offered to further the professional development of selected industrial education teachers, administrators,

and other qualified individuals. A major aim is to produce leaders competent to plan, organize, conduct, supervise, or direct industrial education and training programs in a wide variety of educational and organizational settings. Another prime objective is that of helping people to become scholars and research specialists in this field. Graduate plans of study may be designed which relate to a broad array of vocational objectives and options, depending upon the particular interests and background of the candidate.

The Department of Industrial Education provides courses and directs research leading to the M.S. and Ph.D. degrees. Special programs of graduate study may be designed for persons who do not have an advanced degree objective but who are concerned about improving their professional qualifications or meeting advanced certification requirements. Such programs are currently available which meet the certification requirements for industrial cooperative education coordinators and for supervisors of trade and industrial education.

Admission to the Graduate School may be granted to graduates of Purdue University or of any other accredited institution. Persons accepted to do advanced study in industrial education must present adequate undergraduate preparation and experience to make graduate study a profitable undertaking.

Persons interested in specific information about advanced work in industrial education may contact the Department of Industrial Education directly. Further information about graduate study, application blanks, and the bulletin of the school may be obtained by writing to: Dean of the Graduate School, Graduate House, Purdue University, West Lafayette, Indiana 47907.

BACHELOR OF SCIENCE DEGREE IN INDUSTRIAL EDUCATION

Each student's program will be based on the major which he has selected. Modifications may be made from time to time to fit individual needs, but in the main the plans of study outlined below will apply in each case.

Purdue University has been designated by the State Board for Vocational Education as a teacher-training institution in vocational trade and industrial education in accordance with the provisions of the federal vocational educational acts. The various industrial education options fulfill the professional training requirements specified by the Indiana State Teacher Training and Licensing Commission for teaching certificates in the field of industrial education.

In order to qualify for the degree of Bachelor of Science in Industrial Education the student must:

1. Complete the curriculum requirements in industrial education as listed in the plans of study which follow, with a selection of electives appropriate to a major area of specialization
2. Complete at least 128 semester hours of course work
3. Present evidence of industrial work experience when such is required in certain curricula.

Industrial Arts Teaching

Offered at: All campuses. (Complete program at West Lafayette only; transfer to West Lafayette Campus recommended after freshman year.)

Prospective teachers of industrial arts study a broad core program of general education subjects essential for all teachers. In addition they develop technical competencies which will enable them to present effective instruction covering a broad range of industrial tools, materials, and processes. They complete a sequence of professional education courses including study of the American school system, educational psychology, methods of teaching, organization of instructional materials, and student teaching. Industrial arts teacher education at Purdue University also offers the individual student an opportunity to acquire a degree of specialization in one or more of the technical subject areas.

FRESHMAN YEAR

First Semester		Second Semester	
(2)	ENGL 101 (English Composition I)	(2)	ENGL 102 (English Composition II)
(3)	MA 153 (Algebra and Trigonometry I)	(3)	MA 154 (Algebra and Trigonometry II)
(3)	PSY 120 (Elementary Psychology)	(3)	IED 210 (Foundation of Industrial Arts)
(1)	IED 110 (Introduction to Industrial Education)	(4)	IED 217 (Wood Technics)
(3)	IED 211 (Industrial Arts Materials and Processes)	(3)	Elective
(2)	EG 114 (Drafting I)		
(14)		(15)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(3)	COM 114 (Fundamentals of Speech Communication)	(4)	IED 242 (Electrical Fundamentals for Teachers)
(3)	CHM 113 (Introductory Chemistry)	(3)	ECON 210 (Principles of Economics)
(3)	SOC 100 (Introduction to Sociology)	(3)	IED 220 (Contemporary American Industry)
(2)	EG 115 (Drafting II)	(3)	Philosophy selective
(4)	IED 245 (General Metals)	(3)	Elective
(1)	General education electives		
(16)		(16)	

JUNIOR YEAR*

Fifth Semester		Sixth Semester	
(4)	IED 344 (Graphic Arts Fundamentals)	(3)	IED 310 (Management of Industrial Arts Laboratories)
(4)	IED 326 (Introduction to Power)	(3)	ED 285 (Educational Psychology)
(3)	PHYS 210 (Nature of Physical Science I)	(3)	PHYS 211 (Nature of Physical Science II)
(3)	Humanities elective	(3)	Technical elective
(3)	Social and behavioral science elective	(3)	Humanities elective
(17)		(15)	

SENIOR YEAR

Seventh Semester		Eighth Semester	
(3)	IED 411 (Industrial Design)	(3)	ED 485 (American School System)
(2)	ED 304 (Principles of Teaching)	(3)	ED 460 (Special Methods of Teaching)
(6)	Technical elective	(6)	ED 464 (Supervised Teaching)
(3)	Social and behavioral science elective	(3)	ED 469 (Organization of Instruction Materials)
(3)	General education elective	(3)	IED 481 (Comprehensive General Shop)
(17)		(18)	

* Students must be admitted to the program for the preparation of teachers before being permitted to register for education courses.

Technology Teaching

Offered at: All campuses. (Complete program at West Lafayette only.)

Graduates of this major will be equipped to teach future technicians who will serve principally as assistants to scientists and engineers. Degree requirements have been established in line with the basic qualifications necessary for effective teaching performance. The program will provide a sound base for professional growth of career teachers in chemical, civil, electrical and electronic, industrial, mechanical, and other technologies.

Only selected graduates from accredited two-year, college level, technician-training programs are eligible for admission to the major. Transfer students are given credit for appropriate courses satisfactorily completed in the two-year institution. As much as 78 semester hours transfer credit may be applied toward the course requirements for graduation, including general studies, mathematics, science, electives, and technical credits.

FRESHMAN YEAR

First Semester		Second Semester	
(2)	ENGL 101 (English Composition)	(2)	ENGL 102 (English Composition)
(3)	SOC 100 (Introduction to Sociology)	(3)	PSY 120 (Elementary Psychology)
(3)	MA 153 (Algebra and Trigonometry I)	(3)	MA 154 (Algebra and Trigonometry II)
(1)	IED 110 (Introduction to Industrial Education)	(9)	Technical specialty credit
(6)	Technical specialty credit		
(15)		(17)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(3)	PHYS 210 (Nature of Physical Science) or CHM 113 (Introductory Chemistry)	(3)	PHYS 211 (Nature of Physical Science)
(3)	MA 223 (Introductory Analysis I)	(3)	COM 114 (Fundamentals of Speech Communication)
(9)	Technical specialty credit	(9)	Technical specialty credit
(15)		(15)	

JUNIOR YEAR*

Fifth Semester		Sixth Semester	
(3)	IED 260 (Principles and Objectives of Industrial Education)	(2)	ED 304 (Principles of Teaching)
(3)	ED 285 (Educational Psychology)	(3)	ECON 210 (Principles of Economics)
(3)	PHIL 110 (Introduction to Philosophy) or PHIL 150 (Principles of Logic)	(3)	Social and behavioral science elective
(4)	Humanities elective	(2)	General education elective
(3)	Advanced technical elective†	(2)	Elective
		(3)	Advanced technical elective
(16)		(15)	

COOPERATIVE YEAR

Seventh Semester		Eighth Semester	
(5)	IED 362 (Cooperative Occupational Internship)‡	(5)	IED 362 (Cooperative Occupational Internship)‡

SENIOR YEAR

Ninth Semester		Tenth Semester	
(3)	IED 375 (Teaching Methods in Occupational Education) or ED 460 (Special Methods of Teaching Industrial Education Subjects)	(3)	IED 510 (Course Construction in Vocational-Industrial-Technical Education)
(3)	ED 485 (The American School System)	(3)	IED 467 (School Shop Management)
(3)	General education elective	(3)	IED 444 (Occupational Analysis for Curriculum Planning)
(2)	Social and behavioral science elective	(6)	ED 464 (Supervised Teaching in Industrial Education Subjects)
(3)	Advanced technical elective		
(2)	Humanities elective		
(16)		(15)	

* Students must be admitted to the program for the preparation of teachers before being permitted to register for education courses.

† A minimum of nine semester hours technical coursework beyond the associate degree will be selected from upper-division School of Technology and other offerings of the University.

‡ IED 462 (Appraisal of Occupational Experience and Competence) may be substituted.

Vocational-Industrial Teaching

Offered at: All campuses. (Complete program at West Lafayette only.)

The prime purpose of this plan of study is to prepare individuals as teachers of vocational-industrial-technical subjects. Certification procedures require that such teachers be competent in the particular trade or occupation for which they are certified. Competency must be verified in terms of past occupational experience (usually three years beyond the learner level) or by controlled experience gained in a cooperative plan which is offered as an integral part of an undergraduate curriculum. Thus, there are two tracks to this plan of study. One track involves "demonstrated trade competency" based upon past occupational experience for which the student may be granted up to 32 semester hours of credit toward his degree. This may shorten the time to earn the degree to approximately three years. The other track provides opportunity for the individual to gain his occupational competency through "cooperative occupational internship" as a part of his degree requirement and gain a like amount of credit. This track requires five full calendar years for completion since it includes 30 months with industry.

Persons interested in pursuing either of these plans should consult the department for a full explanation of details and procedures.

FRESHMAN YEAR

First Semester		Second Semester	
(2)	ENGL 101 (English Composition I)	(2)	ENGL 102 (English Composition II)
(3)	MA 153 (Algebra and Trigonometry I)	(3)	MA 154 (Algebra and Trigonometry II)
(1)	IED 110 (Introduction to Industrial Education)	(3)	Social and behavioral sciences elective
(3)	SOC 100 (Introductory Sociology)*	(3)	ECON 210 (Principles of Economics)
(3)	PSY 120 (Elementary Psychology)*	(4)	Technical elective
(4)	Technical elective		
(16)		(15)	

First Summer Session

(3) IED 362 (Cooperative Occupational Internship)†

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* Students of junior standing may be required by the department offering the course to take a specified 300-level course.

† IED 462 (Appraisal of Occupational Experience and Competency) may be substituted for IED 362.

SOPHOMORE YEAR

Third Semester

(5) IED 362 (Cooperative Occupational Internship)*

Fourth Semester

(3) CHM 113 (Introductory Chemistry) or
PHYS 210 (Nature of Physical Science)
(3) IED 260 (Principles and Objectives of Industrial Education)
(3) COM 114 (Fundamentals of Speech Communication)
(3) General education elective
(4) Technical elective

(16)

Second Summer Session

(3) IED 362 (Cooperative Occupational Internship)*

JUNIOR YEAR†

Fifth Semester

(5) IED 362 (Cooperative Occupational Internship)*

Sixth Semester

(3) PHYS 211 (Nature of Physical Sciences)
(2) Social and behavioral science elective
(3) PHIL 110 (Introduction to Philosophy) or
PHIL 150 (Principles of Logic)
(3) ED 285 (Educational Psychology)
(3) Humanities elective
(3) Elective

(17)

Third Summer Session

(3) IED 362 (Cooperative Occupational Internship)*

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* IED 462 (Appraisal of Occupational Experience and Competency) may be substituted for IED 362.

† Students must be admitted to the program for the preparation of teachers before being permitted to register for education courses.

COOPERATIVE YEAR

Seventh Semester

(5) IED 362 (Cooperative Occupational Internship)*

Eighth Semester

(5) IED 362 (Cooperative Occupational Internship)*

Fourth Summer Session

(3) IED 362 (Cooperative Occupational Internship)

SENIOR YEAR

Ninth Semester

(3) IED 375 (Teaching Methods in Occupational Education)
(3) ED 485 (The American School System)
(2) ED 304 (Principles of Teaching)
(3) General education elective
(2) Life and physical science elective
(3) Humanities elective
(1) Elective

(17)

Tenth Semester

(6) ED 464 (Supervised Teaching in Industrial Education Subjects)
(3) IED 444 (Occupational Analysis for Curriculum Planning)
(3) IED 510 (Course Construction in Vocational-Industrial-Technical Education)
(3) IED 467 (School Shop Management)

(15)

* IED 462 (Appraisal of Occupational Experience and Competency) may be substituted for IED 362.

DEPARTMENT OF INDUSTRIAL SUPERVISION

Undergraduate programs in the Department of Industrial Supervision are designed to prepare students for careers in supervisory management, personnel work, and employee training and development. These careers are found in such organizations as businesses, educational institutions, government agencies, hospitals, and industrial firms. Industrial supervision graduates are employed in these organizations in such positions as supervision, personnel, training and development, customer service, field engineering, plant engineering, production control, production engineering, process engineering, programming, project engineering, purchasing, quality control, sales, and technical writing.

In addition to the regular undergraduate four-year program, a student may choose to gain practical work experience by participating in the Industrial Supervision Cooperative Education Program.

Cooperative Education Program

The Industrial Supervision Cooperative Education Program is designed to combine university study and work-learning experience. The co-op student's work-learning experience is directly related to the plan of study he is following on campus, and it is obtained in an employing organization in either business, industry, or government. A rotational schedule (i.e., alternating semesters between the campus and the employing organization) provides the co-op student with a blend of earning, learning, and practical work experience. This approach makes both the classroom study and the work-learning experience more meaningful.

Additional Information About the Cooperative Education Program

1. It usually requires four and one-half or five years to complete the co-op program.
2. The co-op student follows the same plan of study as the student who does not co-op, and he may enroll in either the supervision major or the personnel major.
3. The co-op student's schedule of university study periods and work-learning periods is arranged on an individual basis. This approach is used in order to best meet the needs of the co-op student, the University, and the employing organization.
4. The work-learning periods provide the co-op student with a variety of diversified but related experiences, with increasing responsibility and challenge in an employing organization.
5. The co-op student earns academic credits for each of his work-learning periods. These credits are applied as elective credits and are used to meet the student's degree requirements. The credits will not substitute for required courses.
6. The co-op student receives a grade in connection with the academic credits he earns during each work-learning period.
7. To be selected for the co-op program a student must have a graduation index of 4.00 or higher after a minimum of two semesters of academic work.

Student Organizations

Associated with the Department of Industrial Supervision is the Purdue University student chapter of the American Society for Training and Development. It was the first and the largest student organization affiliated with this international professional society. Among its major aims are bringing students and practitioners closer together; obtaining and exchanging information about current training experiences, ideas, and methods; and stimulating and maintaining interest in effective, organized training in business, industry, and government. All students interested in working with people are eligible for membership in this chapter.

Bachelor of Science Degree

Supervision Major

Offered at: All campuses. (Complete four years at West Lafayette and Fort Wayne.)

The student selecting the supervision major may enroll in the regular program of study for this major or he may elect to pursue the major by entering the Industrial Supervision Cooperative Education Program.

FRESHMAN YEAR

First Semester		Second Semester	
(3)	EG 110 (Drafting Fundamentals)	(2)	EG 210 (Industrial Sketching)
(2)	ENGL 101 (English Composition I)	(2)	ENGL 102 (English Composition II)
(3)	IED 111 (Introduction to Materials and Processes)	(3)	PSY 120 (Elementary Psychology)
(1)	IS 100 (Introduction to Industrial Supervision)	(3)	SOC 100 (Introductory Sociology) or 312 (American Society)
(5)	MA 150 (Mathematics for Technology)*	(2)	MET 215 (Welding)
(2)	Elective	(3)	COM 114 (Principles of Speech)
(16)		(15)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(2)	EET 214 (Electricity Fundamentals)	(3)	IS 374 (Industrial Supervision)
(3)	ECON 210 (Principles of Economics)	(3)	EET 433 (Electronics Fundamentals)
(3)	Communication selective	(3)	IE 470 (Materials Processing)
(3)	IS 262 (Supervised Work Experience)	(3)	INDM 200 (Introductory Accounting)
(3)	Math/science selective	(3)	Math/science selective
(2)	Elective	(3)	Elective
(16)		(18)	

* See mathematics footnote, p. 9.

JUNIOR YEAR

Fifth Semester		Sixth Semester	
(3)	IS 375 (Basic Methods of Training)	(4)	PHYS 219 (General Physics)
(3)	INDM 201 (Cost Accounting)	(3)	IE 366 (Production Management)
(3)	IS 331 (Occupational Safety and Health)	(3)	INDM 431 (Personnel Relations)
(4)	PHYS 218 (General Physics)	(3)	Introductory CS/CPT course
(3)	Elective	(3)	Elective
(16)		(16)	

SENIOR YEAR

Seventh Semester		Eighth Semester	
(3)	INDM 430 (Labor Relations)	(3)	IS 574 (Managerial Training and Development)
(3)	IE 477 (Work Methods and Measurements)	(3)	SOC 416 (Industrial Sociology)
(3)	IS 474 (Conference Leadership)	(3)	PSY 572 (Organization Psychology)
(3)	Communication selective	(3)	Elective
(3)	ENGL 420 (Business Letter Writing)	(3)	Elective
(3)	IS 376 (Personnel Problems in Industry)	(3)	Elective
(18)		(18)	

Personnel Major

Offered at: All campuses. (Complete four years at West Lafayette and Fort Wayne.)

The student selecting the personnel major may enroll in the regular program of study for this major or he may elect to pursue the major by entering the Industrial Supervision Cooperative Education Program.

FRESHMAN YEAR

First Semester		Second Semester	
(3)	EG 110 (Drafting Fundamentals)	(2)	EG 210 (Industrial Sketching)
(2)	ENGL 101 (English Composition I)	(2)	ENGL 102 (English Composition II)
(3)	IED 111 (Introduction to Materials and Processes)	(3)	PSY 120 (Elementary Psychology)
(1)	IS 100 (Introduction to Industrial Supervision)	(3)	SOC 100 (Introductory Sociology) or SOC 312 (American Society)
(5)	MA 150 (Math for Technology)*	(2)	MET 215 (Welding)
(2)	Elective	(3)	IS 252 (Human Relations in Industry)
(16)		(15)	

* See mathematics footnote, p. 9.

SOPHOMORE YEAR

Third Semester

(2) EET 214 (Electricity Fundamentals)
(3) ECON 210 (Principles of Economics)
(3) COM 114 (Principles of Speech)
(3) IE 470 (Materials Processing)
(3) Math/science selective
(2) Elective

(16)

Fourth Semester

(3) IS 374 (Industrial Supervision)
(3) EET 433 (Electronics Fundamentals)
(3) INDM 200 (Introductory Accounting)
(3) Math/science selective
(3) IS 262 (Supervised Work Experience)
(3) Elective

(18)

JUNIOR YEAR

Fifth Semester

(3) IS 375 (Basic Methods of Training)
(3) Communication Selective
(3) IS 331 (Occupational Safety and Health)
(4) PHYS 218 (General Physics)
(3) Elective

(16)

Sixth Semester

(3) IE 477 (Work Methods and Measurements)
(3) IS 474 (Conference Leadership)
(4) PHYS 219 (General Physics)
(3) INDM 430 (Labor Relations)
(3) INDM 431 (Personnel Relations)

(16)

SENIOR YEAR

Seventh Semester

(3) Introductory CS/CPT Course
(3) IS 574 (Managerial Training and Development)
(3) ENGL 420 (Business Letter Writing)
(3) INDM 553 (Labor Law I)
(3) IS 376 (Personnel Problems in Industry)
(3) Personnel selective

(18)

Eighth Semester

(3) SOC 416 (Industrial Sociology)
(3) PSY 572 (Organization Psychology)
(3) INDM 554 (Labor Law II)
(3) Personnel selective
(3) Elective
(3) Elective

(18)

CERTIFICATE PROGRAMS

The certificate programs are designed primarily for the mature, part-time student through consultation with representatives from labor, industry, and the service areas of our society.

Progress in each of these programs can be varied to suit the needs of the individual student who may take one, two, or three courses each semester. The average part-time student can complete any one of the programs within three years.

Enrollment is on the basis of a program carefully tailored to meet individual student needs and vocational objectives through consultation with an experienced counselor. Changes in the student's program arising out of new work assignments or changes in vocational objective may be worked out with his counselor.

Students successfully completing personal service courses earn certificate units and not University credit.

Flight Instruction Courses

The Department of Aviation Technology offers a total of 30 flight and ground support courses on the West Lafayette Campus. These courses are for election by any student in the University, including special students, with the approval of his or her adviser and the General Aviation Flight Technology Section. University staff members will be eligible to enroll in these courses. Registration in these courses is subject to limitations imposed by the availability of flight equipment. Registration in the flight courses will be on a first-come first-served basis.

Physical Examination. Arrangements for a flight physical examination must be made by the beginning student. This examination must be administered by an approved FAA medical examiner. A listing of approved examiners is to be found in the flight instruction office at the Purdue Airport. Students in advanced courses offering flight must possess a second-class medical certificate dated within the preceding 12 calendar months; students in private pilot area courses are required to hold a third-class physical issued within the preceding 24 calendar months. These physical requirements must be accomplished before enrollment.

PERSONAL SERVICE COURSES
(Noncredit)

Certificate Units	Course Number and Title	Fee
(1)	AT 50 (Pilot Refresher)	$200
(1)	AT 51 (General Flight Refresher and Orientation)*	255
(1)	AT 52 (Instrument Pilot Refresher)*	260
(1)	AT 53 (Multi-engine Rating Refresher)	250
	(Additional multi-engine hourly rate)	55
(1)	AT 54 (Flight Instructor Refresher)	285

* Have supporting noncredit ground school courses.

(1)	AT 55 (Cross Country Refresher)*	$235
(3)	AT 56 (Accelerated Instrument Course)*	670
(1)	AT 59 (Link Trainer Flight)	150
(2)	AT 60 (Accelerated Instrument Academic Course)	100
(1)	AT 61 (Aviation Indoctrination)	60
(1)	AT 62 (Aviation Indoctrination Flight Option)	95
(0)	AT 63 (Flight Proficiency Placement)	25
(1)	AT 65 (Basic Aerobatic Flight Maneuvers)	220

UNDERGRADUATE COURSES

Credits	Course Number and Title	Enrollment Fee	Continuation Fee	Combined Cost
(1)	AT 143 (Private Flight)	$285	$350	$635
(1)	AT 148 (Commercial Flight I)	285	350	635
(1)	AT 243 (Commercial Flight II)	285	350	635
(1)	AT 248 (Commercial Flight III)	285	350	635
(1)	AT 253 (Instrument Flight)	285	350	715
(2)	AT 351 (Flight Instructor)	270	and 80 240	510
(1)	AT 353 (Multi-Engine Rating)	500	...	500

	FLIGHT SUPPORT GROUND COURSES*	Fee
(3)	AT 144 (FAA Private Requirements)	$75
(3)	AT 149 (FAA Commercial Requirements I)	75
(3)	AT 244 (FAA Commercial Requirements II)	75
(3)	AT 249 (FAA Commercial Requirements III)	75
(3)	AT 254 (FAA Instrument Requirements)	75
(3)	AT 352 (Flight Instructor Lectures)	75

	SIMULATOR COURSES	Fee
(2)	AT 420 (Airways Procedures III)	$150
(2)	AT 421 (Airways Procedures IV)	150
(2)	AT 422 (Airways Procedures V)	150

Practical Industrial Electronics

This program emphasizes applications and consists of laboratory-type courses with two three-hour classes a week. One hour of explanation of electrical principles and demonstration of the use of instruments is presented at each class meeting, accompanied by two hours of laboratory experience. Training is obtained by the actual use of modern electronic instruments. Troubleshooting techniques are emphasized.

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* Have supporting noncredit ground school courses.

Training in mathematics is desirable, but it is not necessary that students have formal training in algebra, geometry, and trigonometry. The necessary mathematics is taught in the course. Students who pass an advanced standing examination will be admitted to the second semester or the second year course. High school graduation is not required.

Certificate Units	Course Number and Title
	First Semester
(4)	EET 15 (Basic Electricity)
	Second Semester
(4)	EET 23 (Transistor and Vacuum Tube Fundamentals)
	Third Semester
(4)	EET 39 (Electronic Circuits)
	Fourth Semester
	Two options are available:
(4)	EET 41 (Electronic Control Circuits)
	or
(4)	EET 45 (Communications Electronics)

Highway Technician

Offered at: Fort Wayne, Indianapolis, North Central.

This program is offered during the summer term by the Department of Construction Technology in conjunction with the Indiana State Highway Commission. Tuition is paid by the State Highway Commission, and students are paid a nominal salary while attending school provided satisfactory grades are maintained. At the completion of the program, those students who pass are given jobs with the Indiana State Highway Commission and are obligated to work there for a minimum of one year. Nine of the 11 credit hours can be applied toward the degree of Associate in Civil Engineering Technology.

Certificate Units	Course Number and Title
(3)	CET 100 (Technical Computations)
(3)	CET 104 (Elementary Surveying)
(2)	CET 208 (Route Surveying)
(3)	EG 110 (Drafting Fundamentals)

Professional Foremanship

Offered at: Calumet.

The professional foremanship certificate program is an intensive and practical curriculum equivalent to 36 semester hours. It is intended to provide foremen with the professional education needed to handle the many supervisory and technical problems which they meet daily in technical, communications, and human relations fields.

The program has been set up by representatives of industry, professional foremen's organizations, and the Department of Industrial Supervision. It is designed to meet the needs of management, which is vitally concerned with training foremen for positions of leadership. Enrollment is on the basis of a program worked out with the counselor assigned and carefully tailored to individual needs.

Students admitted in the temporary classification may qualify for the certificate in professional foremanship by taking approved undergraduate-level, lower-division technology courses for which their admission classification establishes eligibility and for which they have necessary prerequisites. Appropriate credits earned in this program while in the temporary student classification may be used for credit toward an associate degree under rules governing reclassification as a regular student.

REQUIRED COURSES

Certificate Units			Course Number and Title
(3)	IET	104	(Industrial Organization and Production)
(3)	PSY	120	(Elementary Psychology)
(3)	IS	152	(Human Relations in Industry)
(3)	COM	114	(Fundamentals of Speech Communication)

OPTIONAL COURSES

	Hours Maximum
Group I (14 semester hours maximum)	
Communication	10
English and report writing	7
Advanced courses in interpersonal communication (speech)	3
Economics and labor relations	6
Physical sciences	12
Group II (8 semester hours maximum)	
Courses specific to two-year certificate curricula	8

Courses from one or more technologies may be elected in this group provided that they relate directly to the individual's duties, responsibilities, or line of promotability and prior approval of the counselor and the head of the department administering the program is obtained.

MANAGEMENT EXPERIENCE

(Equivalent to 12 semester hours)

Before receiving the Professional Foremanship certificate, the candidate must have had two years of successful experience in the management field. Satisfaction of this requirement is met by a confirming letter from the managerial employer under whom the candidate worked. Formal credit is not established for this work, but it is considered equivalent to 12 semester hours of credit in the professional foremanship program.

Practical Nursing

Offered at: Calumet Campus.

Accredited by the National League for Nursing.

The program of practical nursing is within the Department of Nursing. The purpose is to prepare a person to give nursing care to the subacutely ill, the convalescent, the chronically ill, the aged, and infirm patients in hospitals and other institutions or the home under the supervision of a registered professional nurse or licensed physician.

The program is accredited by the Indiana State Board of Nurses Registration and Nursing Education. It is one calendar year in length. In the first 16 weeks of the curriculum, classroom and laboratory instruction are given in the basic principles of nursing care with the primary emphasis on developing skills and techniques in giving safe and comforting nursing care to patients. In the remaining eight months, students receive clinical experience in the nursing care of medical and surgical patients, mothers and newborn babies, children, and the aged, utilizing cooperating hospitals. They learn to be members of the nursing team under the guidance of the clinical instructor.

Purdue University awards a certificate upon satisfactory completion of the course, and the person is eligible for application to the state board examination for license to practice nursing as a licensed practical nurse (L.P.N.).

Certificate Units	Course Number and Title	
	First Semester	
(1)	NT 4	(Community Health)
(2)	NT 8	(Personal and Vocational Relationships)
(4)	NT 12	(Anatomy and Physiology)
(2)	NT 16	(Family Living)
(4)	NT 20	(Nutrition and Diet Therapy)
(8)	NT 24	(Fundamentals of Nursing)
(21)		
	Second Semester and Summer*	
(11)	NT 44	(Medical Nursing)
(12)	NT 56	(Surgical Nursing)
(12)	NT 64	(Maternal and Child Health Nursing)
(12)	NT 74	(Pediatric Nursing)
(13)	NT 76	(Extended Care)
(60)		

* The following courses are taken in rotation throughout a period of 32 weeks.

SPECIALIZED SERVICE PROGRAMS

The School of Technology cooperates with individual industries or communities in the development and operation of specialized training programs. Such programs normally operate on a regular fee basis but frequently are organized at the request of a particular industry on a contract basis.

Since such specialized service programs are usually restricted to a single location and serve a special need, they are not described in this general catalog and may differ to some extent in entrance requirements, fees, advanced standing provision, and other details from the general fields of study described in this catalog. Included in these specialized programs are industrial programs in cooperation with local industry primarily designed for up-grading technician employees.

Inquiries should be directed to the Dean of Continuing Education or the Dean of the School of Technology on the West Lafayette Campus. At other Purdue campuses, inquiries should be directed to the dean of the respective campus.

SUPERVISION PROGRAMS

A training and development service made available to business, industry, and government on a fee basis, supervision programs is a section within the Department of Industrial Supervision. Its various programs are offered on a noncredit basis.

The objectives of the supervision programs are to: (1) stimulate the process of personal and organization development; (2) offer professional training to individuals and groups to assist them to meet defined training needs and objectives; (3) provide service, research, and instruction concerning the functions, principles, and problems in supervision; and (4) assist people in gaining an appreciation and an understanding of the attitudes, knowledge, and skills involved in supervision.

Training consultation is available to industry and business through the supervision programs, as well as various research activities related to industrial training. The programs of instruction, conducted both on and off campus, are offered on an intensive basis, as part-time (one day per week) programs, and as custom-made personnel development programs designed to meet specific objectives and needs rather than general or basic training needs.

The supervision programs are staffed by faculty members of the Department of Industrial Supervision who have pertinent work experience, professional preparation, and other particular qualifications as specialists in the career field of industrial training. Certain instructional programs also include presentations by selected resource persons who are employed in business and industry. These resource people supplement the teaching performed by the regular full-time or part-time professional faculty.

Description of Courses

COURSES LISTED ON THE FOLLOWING PAGES are, for the most part, being offered during the academic year 1973-74. It is possible that new courses may be added, some courses presently offered may be eliminated, and still others may be

modified in content, combined with others, or revised in some other manner. Students should consult counselors about curriculum development and course requirements, when making a program for the succeeding semester.

For each course in applied science the description should be interpreted as follows: first, the official number of the course; second, its special title; and third, the number of class, laboratory, and credit hours or certificate units. For example,

EET 372. CONTROL LABORATORY. Class 1, Lab. 3, cr. 2.

indicates that EET 372 is entitled Control Laboratory, meets one hour in class and three hours in laboratory per week, and gives two semester hours credit.

Course numbers indicate the following:

0-99—special service courses primarily for adults working for a certificate or toward job improvement;

100-299—lower-division courses normally scheduled for freshmen and sophomores;

300-499—upper-division courses normally scheduled for juniors and seniors;

500-599—dual-level courses that may be scheduled by juniors and seniors, and by graduate students for graduate credit.

ARCHITECTURAL TECHNOLOGY (ART)

D. D. Moss, in charge of curriculum and Head of the Department of Construction Technology

Professor: (Calumet) C. R. Hutton, M.S.

Associate Professors: (Calumet) C. J. McAllister, M.S.C.P.; (IUPUI) W. E. Davis, M.Arch.

Assistant Professors: (Calumet) L. L. Beck, B.S.I.Ed.; G. J. Kachoris, M.A.; Barbara M. Meeker, A.B.; N. G. Scarlatis, M.A.; G. R. Sullivan, M.S.; (Fort Wayne) R. T. Flemming, M.S.; H. F. Kaufman, M.A.; (IUPUI) G. E. Clark, B.S.Arch.; P. J. Leech, B.Arch.; D. L. Richardson, B.Arch.; (North Central) H. S. Driggs, B.S.Arch.

Instructor: (Calumet) E. A. Dudek, B.S.

UNDERGRADUATE LEVEL

Lower-Division Courses

116. CONSTRUCTION DRAFTING. Lab. 6. cr. 2.
Introduction to drafting fundamentals with emphasis on architectural and civil engineering topics. Use of instruments, lettering, orthographic projection, auxiliary views, intersections, perspective, and working drawings.

118. ARCHITECTURAL PROJECTIONS. Lab. 6, cr. 2.
Introduction to projection, intersections, shading and shadows, and perspective drawing.

120. FREEHAND DRAWING I. Lab. 6, cr. 2.
Development of freehand sketching, using pencil, charcoal and ink, as a means of communication with an emphasis on architectural subjects.

150. ARCHITECTURAL CONSTRUCTION I. Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: ART 116 or EG 110.
A study of wood frame construction through a semester project requiring planning, preliminary and working drawings, and a model of the framing system. Field trips may be included.

162. BUILDING MATERIALS AND METHODS. Class 1, Lab. 3, cr. 2.

Properties and use of various building materials in modern construction, and an introduction to the skills and methods related to their erection.

164. BUILDING MATERIALS. Class 2, cr. 2.

Properties and use of materials as found in building construction.

172. SYSTEMS OF CONSTRUCTION. Class 2, cr. 2.

A survey of the organization of the construction industry, and introduction to various building components and systems with emphasis on a non-mathematical study of structural systems.

204. BUILDING REGULATIONS. Class 2, cr. 2.

Building codes, ordinances, and regulations, with emphasis on those for structures in Indiana.

210. HISTORY OF ARCHITECTURE I. Class 3, cr. 3.

Survey of styles and influences of cultures which led to the development of architecture from the earliest times to the present day.

220. FREEHAND DRAWING II. Lab. 6, cr. 2.

Continuation of ART 120. The study of color theory and the use of color techniques in architectural presentations.

222. ARCHITECTURAL CONSTRUCTION II. Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: ART 150.

Preparation of preliminary and working drawings for an intermediate-sized commercial or institutional building.

224. ARCHITECTURAL CONSTRUCTION III. Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: ART 222.

Continuation of ART 222 with emphasis on larger and more complex structures.

276. SPECIFICATIONS AND CONTRACT DOCUMENTS. Class 2, cr. 2.

Preparation of general conditions and major phases of building construction specifications, study agreements, contracts, liens, and bonds.

284. MECHANICAL EQUIPMENT OF BUILDINGS. Class 3, cr. 3.

A study of plumbing, heating and air-conditioning for residential and commercial buildings. Water supply and drainage systems, heat loss and heat gain, heating systems, and air-conditioning systems.

285. ELECTRICITY FOR BUILDINGS. Class 2, cr. 2.

A survey of electrical and lighting requirements for residential and commercial buildings. Lighting fundamentals and design, electric circuits, power requirements, and wiring layout.

299. ARCHITECTURAL TECHNOLOGY. Cr. 1-4.

Hours and subject matter to be arranged with staff. Course may be repeated up to nine hours.

UNDERGRADUATE LEVEL
Upper-Division Courses

310. HISTORY OF ARCHITECTURE II. Class 3, cr. 3. Prerequisite: ART 210.

A survey of architectural developments of the nineteenth and twentieth centuries.

341. ARCHITECTURAL DESIGN I. Class 1, Lab. 5, cr. 3. Prerequisite: ART 224.

Planning, development, and architectural delineation of small structures with pencil, charcoal, and water color.

342. ARCHITECTURAL DESIGN II. Class 1, Lab. 5, cr. 3. Prerequisite: ART 341.

Continuation of ART 341 with emphasis on larger and more complex structures.

360. COMMUNITY PLANNING I. Class 2, Lab. 3, cr. 3.

A study of planning methods, legislation, and agencies. Emphasis on collection of data about an existing community and the preparation of land-use maps from that data.

362. COMMUNITY PLANNING II. Class 1, Lab. 6, cr. 3. Prerequisite: ART 360.

Application of planning methods to the development of a new community or the redevelopment of an existing community.

460. REAL ESTATE. Class 3, cr. 3.

A study of the legal aspects and practices of the real estate business, including appraising, finance, property management, and land development.

476. SPECIFICATIONS. Class 3, cr. 3.

Expansion of the general principles of construction documents covered in ART 276. Detailed study of purpose and intent of specifications. Preparation of various sections of specifications for specific jobs, including development of the general conditions, adaptation of selected provisions from standard specifications, and delineation of special supplemental conditions.

490. SENIOR PROJECT. Cr. 1-6.
Final project aimed at combining the skills and knowledge gained from the various areas of studies. The student will be expected to report graphically, orally, and in written form on a final project approved by the adviser. Presentation will be made to a representative board of the faculty determined by the adviser.

499. ARCHITECTURAL TECHNOLOGY. Cr. 1-4.
Hours, subject matter, and credit to be arranged with staff. Course may be repeated for credit up to nine hours.

AVIATION TECHNOLOGY (AT)

J. R. Maris, Head of the Department

Professors: W. P. Duncan, M.S.; J. R. Maris, B.S.; I. E. Treager, M.S.

Associate Professors: E. R. Blatchley, M.S.; C. F. Holleman, B.S.

Assistant Professors: R. F. Carton, M.S.; G. W. Dennis, M.S.; R. J. Hamilton, M.S.; E. K. Hoover, M.S.; J. A. Marchand, B.S.; Jill S. McCormick, FAA Cert.; J. P. Oberholtzer, M.S.; J. R. Rardon, M.S.; Albert Toth, M.S.; R. T. Tuite, B.S.; R. C. Wesley, FAA Cert.

Instructors: R. M. Burns, B.S.; T. Q. Carney, B.S.; L. W. Gross, B.S.; R. M. Grundman, B.S.; T. L. Harshbarger, M.S.; M. S. Moreno, B.S.; W. A. Turner, B.S.

PERSONAL SERVICES COURSES

Students successfully completing personal service courses numbered 1-99 earn certificate units and not University credit.

50. PILOT REFRESHER. Cert. units 1. Prerequisite: FAA pilot certification or AT 143.
A flight course consisting of three hours of dual instruction and seven hours of solo flight to include no cross country flight.

51. GENERAL PILOT REFRESHER AND ORIENTATION. Cert. units 1.
A flight course designed for the non-pilot to orient teachers and others in the development of aviation flight. Eight hours of dual instruction and ten hours of classroom discussion.

52. INSTRUMENT PILOT REFRESHER. Cert. units 1.
Open only to FAA certified commercial pilots or equivalent, as determined by a review of flight experience and a proficiency check flight.
A course designed primarily to refresh FAA certified instrument pilots, but may be utilized by pilots who desire a nominal amount of instrument instruction in the preparation for FAA instrument certification. Ten hours of dual flight instruction are provided.

53. MULTI-ENGINE RATING REFRESHER. Cert. units 1. Open only to FAA certified pilots who hold multi-engine ratings.
Consists of five hours dual flight instruction and designed to refamiliarize the multi-engine rated pilot with multi-engine techniques.

54. FLIGHT INSTRUCTOR REFRESHER. Open only to FAA certified flight instructors or equivalent, as determined by a review of flight experience and a proficiency check flight.
A course designed primarily to refresh and update FAA certified flight instructors, but may be utilized by pilots who desire a nominal amount of instruction in preparation for FAA flight instructor certification. The course consists of seven hours of dual flight instruction, three hours of solo, and ten hours of classroom instruction.

55. CROSS COUNTRY REFRESHER. Cert. units 1. Prerequisite: AT 143 or FAA pilot certification.
A course consisting of four hours dual, six hours solo, and five hours classroom discussion designed to increase cross country flight techniques or to enable the pilot to retain already learned skills.

56. ACCELERATED INSTRUMENT COURSE. Cert. units 3. Open only to FAA certified commercial pilots or equivalent, as determined by a review of flight experience and a proficiency check flight.
A course designed primarily for those pilots who have had some instrument training, and thirty hours of classroom instrument training in preparation for FAA instrument certification. The course consists of twenty hours of dual flight instruction, ten hours of ground pilot

trainer, and thirty hours of classroom instruction.

59. GROUND PILOT TRAINER. Cert. units 1. Open to all grades of pilot certificate holders.

A course in ground pilot trainer consisting of ten hours of supervised instruction.

60. ACCELERATED INSTRUMENT ACADEMIC COURSE. Cert. units 2. Open to all grades of pilot certificate holders.

A course in the academic area of instrument flight techniques consisting of 36 hours of classroom instruction in instrument rating fundamentals.

61. AVIATION INDOCTRINATION. Cert. units 1.

A course in the principles of flying and radio navigation consisting of ten hours of instruction.

62. AVIATION INDOCTRINATION. (Flight Option) Cert. units 1. Prerequisite or corequisite: AT 61.

A course in basic flying techniques, the use of radio for communication, and navigation, consisting of four hours of dual flight instruction.

63. FLIGHT PROFICIENCY PLACEMENT. Cr. 0.

A one hour evaluation flight to determine individual flight proficiency for course placement.

65. BASIC AEROBATIC FLIGHT MANEUVERS. Cert. units 1. Open only to certificated private pilots or above.

A course designed for pilots who desire instruction in the performance of basic aerobatic maneuvers. Recoveries from unusual attitudes and confidence type maneuvers will be stressed. Additional maneuvers performed will be tailored to individual student capabilities and desires. Students will be expected to develop proficiency in the aircraft before beginning aerobatic training. Individuals with little or no conventional geared aircraft experience will require a longer introductory period.

Seven hours of dual flight instruction and three hours of solo flight are provided.

UNDERGRADUATE LEVEL

Lower-Division Courses

100. INTRODUCTION TO AVIATION TECHNOLOGY. Class 1, cr. 1.

Introduction to the Department of Aviation Technology and its curricula and an overview of the career opportunities in aviation and related fields.

112. AIRCRAFT PISTON ENGINES. Class 3, Lab. 6, cr. 5.

Fundamental principles of aircraft engines, including engine theory, materials and methods of construction, lubricants and lubrication systems, induction systems and superchargers, engine installation and run-up, disassembly and inspection of various types of aircraft engines.

113. FEDERAL AIR REGULATIONS AND FORMS. Lab. 2, cr. 1.

Familiarization with federal air regulations governing safe practices in maintenance and inspection of airframes and power plants will be given. Repeated practice in the completion of the forms required to report on maintenance and inspection practices will be accomplished.

114. AIRCRAFT PISTON ENGINE ACCESSORIES. Class 3, Lab. 3, cr. 4.

Fundamental principles of aircraft engine accessories, including theoretical and practical work on float and pressure injection carburetors, fuel injection systems, magnetos and ignition systems, generators and generator control systems.

115. AIRCRAFT STRUCTURES. Class 3, Lab. 6, cr. 5.

A study of the design, fabrication, and maintenance of aircraft structures. Laboratory work involves experience with the materials and processes involved in fabrication and repair of structural assemblies.

116. AIRFRAME MAINTENANCE. Class 3, Lab. 6, cr. 5.

Principles and methods of light aircraft inspection, maintenance and repair of airframes, including fabric and finishing methods and assembly and rigging. Laboratory work includes rebuilding and return to service of a typical light aircraft.

121. AIRCRAFT PISTON ENGINES FOR PILOTS. Class 2, cr. 2.

Fundamental principles of aircraft piston engines and accessories including engine theory, materials and methods of construction, fuels and fuel systems, induction systems and carburetion, lubricants and lubricating systems, ignition systems and propellers.

130. FCC EXAM PREPARATION. Class 3, cr. 3. Corequisite: AT 134.

A study of rules and regulations of the Federal Communications Commission, review of two-way communications theory, and troubleshooting practice in preparation for the Second Class Radiotelephone Operator's License exam.

131. AIRCRAFT ELECTRICITY. Class 1, Lab. 2, cr. 2.

A study of the properties and characteristics of electric and magnetic circuit elements as applied to aircraft DC components and systems. Familiarization with federal air regulations governing proper installation and inspection of electrical systems, batteries, DC power systems, and instruments are considered. Basic properties and characteristics of electrical systems utilizing 400Hz alternating voltage are also discussed.

132. ELECTRONICS I. Class 5, cr. 5.

A study of electrical principles and fundamentals basic to advanced study and application to communications equipment. The major topics include: DC circuits, magnetism, AC circuits, network theorems, electron tubes, and basic transistor theory.

134. ELECTRONICS II. Class 5, cr. 5. Prerequisite: AT 132.

A continuation of theory and circuits employed in AM and FM communications equipment.

135. AVIONICS LABORATORY I. Lab. 6, cr. 2. Corequisite: AT 132.

Develops skill in soldering, use of hand tools, meters, oscilloscope, and power supply. Investigates the effects of resistance, capacitance, and inductance on current and voltage relationships in DC and AC circuits.

136. AVIONICS LABORATORY II. Lab. 6, cr. 2. Corequisite: AT 134.

Develops skill in the use of test equipment in the measurement of electron and semiconductor device parameters. Performance checks will be run on a variety of types of circuits both tube and transistor.

138. AIRCRAFT AND MISSILE ORIENTATION. Class 3, Lab. 3, cr. 4.

A study to assist the student to meet the challenges and responsibilities of the aerospace age. An understanding will be developed of the underlying scientific principles basic to aerospace vehicle development and operation.

143. PRIVATE FLIGHT. Lab. 4, cr. 1. Prerequisite or corequisite: AT 144.

Flight, ground pilot trainer, and ground instruction in preparation for FAA private pilot certification.

144. PRIVATE PILOT LECTURES. Class 3, cr. 3.

Preparation for the FAA written examination for the private pilot certificate. Covers FAA regulations, theory of flight, aircraft safety, navigation, meteorology, and radio.

148. COMMERCIAL FLIGHT I. Lab. 4, cr. 1. Prerequisite: AT 143, or equivalent, as determined by a review of flight experience and a proficiency check flight; corequisite: AT 149 or 244.

149. COMMERCIAL PILOT LECTURES I. Class 3, cr. 3.

Preparation for the FAA commercial pilot written examination. FAA regulations, general operating and air traffic rules, meteorology, navigation, and principles of safe operation will be highlighted.

209. AIRCRAFT WELDING AND MATERIALS. Class 1, Lab. 3, cr. 2.

Welding practices applied to aircraft materials; alloys of steel, aluminum, magnesium and nickel.

210. AIRCRAFT ENGINE OPERATION. Lab. 3, cr. 1. Prerequisites: AT 112 and 114; corequisite: AT 214.

Operation and diagnostic testing of aircraft engines. Students will collect operating data and make performance calculations. Inspection, testing, and adjustments will be made to engine systems. Use of test equipment such as engine and ignition analyzers will be emphasized.

211. TRANSPORT AIRCRAFT MAINTENANCE. Lab. 6, cr. 2.

An introduction to the maintenance procedures, planning, and records required of a certificated airline utilizing transport category equipment.

213. AIRCRAFT SYSTEMS. Class 3, Lab. 3, cr. 4.

Inspection, maintenance, and theory of operation of aircraft hydraulic, electrical, fuel and oil, pressurization, anti-icing, and instrument systems.

214. AIRCRAFT GAS TURBINE ENGINES. Class 3, Lab. 5, cr. 5.

Fundamental principles of jet engines, including the study of compressors, combustion chambers, turbines, fuel controls, fuel systems, lubrication, and ignition systems. Disassembly, inspection, and run up of various gas turbine engines. Familiarization with turboprops, rockets, pulse jets, and ram jets will also be given.

215. AIRCRAFT ELECTRICITY. Class 3, Lab. 6, cr. 5.

A study of aircraft electrical systems as they are inter-related with other aircraft systems, power plants, circuits, instrumentation, apparatus, and controls, including their inspection, operation, and maintenance.

216. AIRCRAFT PROPELLER SYSTEMS. Class 1, Lab. 3, cr. 2.

A comprehensive course on propeller theory, function, and operation. A wide range of types and sizes of propellers will be covered for consideration on operations, inspection, maintenance, and overhaul procedures and practices.

218. GENERAL AVIATION AIRCRAFT MAINTENANCE. Lab. 3, cr. 1.

Maintenance of airworthy powerplants, accessories, and airframes of general aviation type aircraft in accordance with FAA regulations.

219. SURVEY OF FAA MECHANIC REQUIREMENTS. Lab. 5, cr. 2.

Must be taken during the final semester for the completion of the A.A.S. degree in aviation maintenance technology.

A survey and review of the requirements as set forth in appropriate FAA publications indicating skill, knowledge, and experience requirements necessary to exercise the privileges of the airframe and powerplant mechanic.

230. AIRCRAFT NAV/COMM SYSTEMS. Class 5, cr. 5. Prerequisite: AT 134; corequisite: AT 232.

A study of characteristics and operation of typical aircraft navigation and communication equipment. Discussed are VHF transmitters and receivers, Slave gyro compass, ADF, ILS, and Omni systems. A study of the manufacturer's manual is included to familiarize the student with proper maintenance procedures.

232. ELECTRONICS III. Class 3, cr. 3. Prerequisite: AT 134.

A study of basic numbering systems, codes, logic gates, converters, multivibrator circuits, binary counters, shift registers, data transfer, and conversion circuits.

233. AIRCRAFT PULSE AND MICROWAVE SYSTEMS. Class 3, cr. 3.

Characteristics and operation of a typical weather radar are studied. Radar systems measurements and test equipment are discussed. Also, the operation of DME and ATC transponder is included.

234. ELECTRONICS IV. Class 3, cr. 3. Prerequisites: AT 230 and 232; corequisites: AT 233 and 236.

A survey of new devices, circuits, and systems in the avionics field. Topics for discussion include area-navigation, inertial, automatic test equipment, collision avoidance, head-up displays, aircraft integrated data system, and performance and failure assessment monitor equipment.

235. AVIONICS LABORATORY III. Lab. 6, cr. 2. Corequisites: AT 230 and 232.

Introduction to navigation and communications equipment servicing, troubleshooting, and repair.

236. AIRCRAFT AUTOMATIC FLIGHT CONTROL SYSTEMS. Class 3, cr. 3.

A study of current aircraft automatic flight control devices and systems. The course will include requirements and elements necessary for all-weather landing capability. Autopilot systems, couplers, flight director systems, comparator warning systems, and radio altimeter systems will be discussed.

237. AVIONICS LABORATORY IV. Lab. 6, cr. 2. Prerequisite: AT 235; corequisite: AT 233.

A continuation of practical work begun in AT 235. In addition to work on standard Nav/Comm systems, testing of distance measuring equipment, transponder, and radar will be included.

241. AIRCRAFT ELECTRICITY FOR FLIGHT CREW MEMBERS. Class 1, Lab. 2, cr. 2.

A study of basic aircraft electrical systems. Primary emphasis will be placed upon increasing the pilot's knowledge and appreciation of the functioning of aircraft electrical systems.

243. COMMERCIAL FLIGHT II. Lab. 4, cr. 1. Corequisite: AT 149 or 244.

244. COMMERCIAL PILOT LECTURES II. Class 2, cr. 2.

Preparation for the FAA commercial pilot written examination. FAA requirements, general operating and air traffic rules, meteorology, navigation, and principles of safe operations will be highlighted.

248. COMMERCIAL FLIGHT III. Lab. 4, cr. 1. Prerequisite: AT 243; corequisite: AT 249 or equivalent.

249. COMMERCIAL PILOT LECTURES III. Class 3, cr. 3. Prerequisites: AT 149 and 244.

A continuation of AT 149 and 244.

253. INSTRUMENT FLIGHT. Lab. 4, cr. 1. Prerequisite: FFA commercial pilot certificate, or equivalent determined from a review of flight experience and a proficiency check flight; corequisite: AT 254.

Prepares the student for the FFA instrument rating. The student will receive both dual instrument flight instruction, and ground pilot trainer instruction.

254. INSTRUMENT LECTURES. Class 3, cr. 3.

Covers FFA regulations, meteorology, aircraft theory of flight, navigation and flight instruments, radio and navigational aids, and navigational and instrument flight procedures.

290. AVIATION PROJECT. Cr. 1-4.

Independent study primarily for sophomore students who wish to pursue study and developmental work in special areas. Subject material must be arranged with the instructor before enrolling in the course.

299. AVIATION TECHNOLOGY. Cr. 1-4.

Hours, credit and subject matter to be arranged by staff, may be repeated for credit up to six hours.

UNDERGRADUATE LEVEL
Upper-Division Courses

320. AERONAUTICS. Class 3, cr. 3.

Course designed to cover basic subsonic, transonic, and supersonic aerodynamics; airplane structures; airborn weather radar; high altitude weather; aviation physiology and high speed aircraft performance.

321. AIRWAYS PROCEDURES I. Class 2, Lab. 2, cr. 3.

An introduction to airways procedures and instrument flight techniques. Experience in the utilization of radio and navigation aids in instrument flight is provided in synthetic flight trainers. Large reciprocating multi-engine aircraft procedures will be introduced.

322. AIRWAYS PROCEDURES II. Class 2, Lab. 2, Lab. 2, cr. 3. Prerequisite: AT 321.

A continuation of AT 321. Airways procedures and instrument flight techniques for multi-engine aircraft will be stressed. Federal Aviation regulations pertaining to the operation of multi-engine aircraft will be introduced. Training will be conducted in a reciprocating multi-engine flight simulator.

325. AIRLINE ORGANIZATION. Class 1, cr. 1.

Discussion of airline history, organization, equipment, operating costs, and revenues, aircraft utilization, aircraft maintenance, and engineering, passenger and cargo operations.

329. MULTI-ENGINE AIRCRAFT SYSTEMS AND OPERATIONS. Class 2, cr. 2.

A study of systems, normal and emergency operating procedures for reciprocating engine powered multi-engine aircraft and simulator used in the program.

351. FLIGHT INSTRUCTOR FLIGHT. Lab. 4, cr. 1. Prerequisite: AT 248, or equivalent, as determined by a review of flight experience, and a proficiency check flight; corequisite: AT 352.

Flight training in preparation for flight instructor certification. Instructional techniques are demonstrated and practiced by the student. Analysis of maneuvers is also included.

352. FLIGHT INSTRUCTOR LECTURES. Class 3, cr. 3.

Preparation for the FAA flight instructor and advanced ground instructor written examinations. Covers theory of flight and ground instruction, aircraft performance, analysis of maneuvers, and federal aviation regulations.

353. MULTI-ENGINE FLIGHT. Lab. 2, cr. 1. Prerequisite: FAA commercial or equivalent experience.

354. SUPERVISED FLIGHT OPERATIONS I. Class 1, Lab. 3, cr. 2. Prerequisites: AT 253 and AT 353, or equivalent as determined by a review of flight experience and a proficiency check flight.

355. TRANSPORT AIRCRAFT SYSTEMS AND OPERATIONS I. Class 3, cr. 3.

A study of transport aircraft systems and systems operation. Topics include light turboprop aircraft systems, and turbojet aircraft electrical, powerplant and fuel systems.

357. HIGH ALTITUDE OPERATION. Lab. 5, cr. 2. Prerequisite: FFA Private Pilot Certificate.

This course is designed to acquaint and orient the student to the operation of and effects on light aircraft at high elevation airports during an intensive two week instructional session. In addition, the course is intended to familiarize the student with mountain flying techniques during cross-country flights.

358. HISTORY OF FLIGHT. Class 3, cr. 3.

This course is designed to trace man's

effort to achieve and sustain flight from early mythology to the present. Special emphasis is given to the evolution of the airplane.

360. AIRCRAFT GAS TURBINE ENGINES FOR FLIGHT CREW MEMBERS. Class 3, cr. 3.
The course includes principles, construction and operation of jet and other forms of gas turbine engines. Also included will be the study of compressors, combustion chambers, turbines, afterburners, water injection systems, materials of construction, fuel controls and other fuel system components, lubricants, lubrication and ignition systems, and engine operation.

410. AIRLINE TRANSPORT PROCEDURES. Class 2, cr. 2.
Review of appropriate regulations, radio, navigational, meterological, and operations principles and procedures applicable to airline transport piloting.

420. AIRCRAFT PROCEDURES I. Class 1, Lab. 2, cr. 2. Prerequisite: AT 322.
An introduction to multiengine jet operating procedures. Training in jet transport aircraft systems operation and flight procedures will be conducted in a multi-engine jet flight simulator.

421. AIRCRAFT PROCEDURES II. Class 1, Lab. 2, cr. 2. Prerequisite: AT 420.
A continuation of AT 420 with emphasis placed upon multiengine jet aircraft performance, flight planning, and instrument procedures. Emergency operating procedures will be introduced. Training will be conducted in a multiengine jet flight simulator.

422. AIRCRAFT PROCEDURES III. Class 1, Lab 2, cr 2. Prerequisite: AT 421.
A continuation of AT 421 with emphasis placed upon multi-engine jet aircraft system emergency operations and emergency flight procedures. Training will be conducted in a multiengine jet flight simulator.

423. FLIGHT ENGINEERING PROCEDURES. Class 2 or 3, cr. 2 or 3.
A comprehensive study of flight engineering procedures for a typical turbojet transport aircraft. Emphasis will be placed upon preparation for the FAA flight engineers oral and flight test. Topics include: aircraft performance and limitations, preflight inspection, operating procedures, and systems review. Sufficient additional trainer instruction to meet FAA requirements for taking the practical test will also be given.

424. TRANSPORT AIRCRAFT SYSTEMS AND OPERATIONS II. Class 3, cr. 3. Prerequisite: AT 355.
A study of turbojet transport aircraft systems and systems operation. Topics include pneumatics, air conditioning, pressurization, flight instruments, hydraulics, landing gear, and flight controls.

426. TRANSPORT AIRCRAFT SYSTEMS AND OPERATIONS III. Class 3, cr. 3. Prerequisite: AT 424.
A study of turbojet transport aircraft systems and systems operation. Topics include auto-pilot, mach trim, anti-icing, communications and navigation radios, radar, fire protection, emergency equipment, oxygen, and federal aviation regulations pertinent to aircraft systems of interest to the flight crew member.

429. ADVANCED NAVIGATION I. Class 3, cr. 3.
A comprehensive study of navigation basics and advanced techniques as employed by international jet transport aircraft. Topics include: dead reckoning, pressure pattern, celestial, I.C.A.O., doppler, Loran, Omega, and inertial navigation.

430. ADVANCED NAVIGATION II. Class 3, cr. 3. Prerequisite: AT 429 or equivalent.
A continuation of advanced navigational techniques with emphasis placed on preparation for the FAA flight navigator's written examination.

431. SUPERVISED FLIGHT OPERATIONS II. Lab. 2, cr. 1. Prerequisite: AT 354.
A continuation of AT 354.

450. AIRLINE TRANSPORT FLIGHT. Lab. 2, cr. 1. Prerequisite: Applicant must have successfully completed the airline transport pilot written examination and meet Federal Aviation regulation requirements for the flight check.
Course provides flight and academic preparation for the airline transport pilot certificate flight check.

490. AVIATION PROJECT. Cr. 1-4.
Independent study for junior and senior students who wish to pursue study and developmental work in special areas. Subject matter area must be arranged with the instructor before enrolling in the course.

491. AVIATION SAFETY PROBLEMS. Class 3, cr. 3.
This course provides the opportunity for students to study problems associated

with aviation safety. Particular attention will be given to the formulation of specific recommendations for improvements of aviation safety.

499. AVIATION TECHNOLOGY. Cr. 1-4.
Hours, credit and subject matter to be arranged by staff, may be repeated for credit up to six hours.

CHEMICAL TECHNOLOGY (CHT)

W. E. Thomas, in charge of curriculum and Head of the Department of Manufacturing Technology

UNDERGRADUATE LEVEL
Lower-Division Courses

109. GENERAL CHEMISTRY. Class 3, Lab. 3, cr. 4.
A one-semester general chemistry course intended for technology students.

201. UNIT OPERATIONS I. Class 3, cr. 3. Prerequisite: MA 150.
This course will acquaint the student with chemical process equipment, its use, and its applications. It focuses study on the principles, materials, systems of equipment, and some of the problems involved in chemical manufacturing processing. Chemical plan operations such as filtration, evaporation, drying, crystallization, solvent extraction, and distillation and fluid handling are described and discussed.

202. UNIT OPERATIONS II. Class 3, cr. 3. Prerequisite: CHT 201.
A continuation of Unit Operations I.

212. INDUSTRIAL CHEMISTRY: QUALITATIVE. Class 2, Lab. 6, cr. 4. Prerequisites: CHM 109 and MA 150 (or equivalent).
Systematic semimicro-analysis, with emphasis upon modern industrial techniques.

225. QUANTITATIVE ANALYSIS: INSTRUMENTAL. Class 3, Lab. 3, cr. 4. Prerequisite: CHM 224.
A continuation of the study of the chemical methods applied in quantitative analysis. Emphasis in this course is on oxidation-reduction reactions, precipitation titrimetry, and the analysis of multicomponent materials. The use of instrumental methods for performing analyses is introduced after the traditional methods have been covered. Emphasis will be upon application, limitations, and common errors in the methods, rather than upon the design, operation, and servicing of specific instruments.

251. ORGANIC CHEMISTRY. Class 4, Lab. 3, cr. 5.
A one-semester organic chemistry course intended for technology students.

252. INDUSTRIAL CHEMISTRY: QUANTITATIVE. Class 2, Lab. 6, cr. 4. Prerequisite: CHT 212.

273. PHYSICAL CHEMISTRY OF MATERIALS. Class 3, cr. 3.
An introductory treatment of the general properties of gases, liquids, and solids and the factors influencing them under extremes of temperature and pressure. This course is specifically designed for technology students.

CIVIL ENGINEERING TECHNOLOGY (CET)

D. D. Moss, in charge of curriculum and Head of the Department of Construction Technology

Professor: (West Lafayette) D. D. Moss, Ph.D.

Associate Professors: (Fort Wayne) L. W. Smith, B.S.C.E., (IUPUI) R. J. Beck, M.S.C.E.; (North Central) R. L. Taylor, M.S.C.E.

Assistant Professors: (Calumet) R. E. Bennett, M.S.; D. E. Cochran, J.D.; (Fort Wayne) E. J. Elnicky, M.S.; R. G. Hoehn, B.S., (IUPUI) P. L. Douglass, M.S.C.E.

UNDERGRADUATE LEVEL
Lower-Division Courses

100. TECHNICAL COMPUTATIONS. Class 3, cr. 3. A study of elements from algebra and trigonometry appropriate to surveying and construction, and of related computational methods including slide rule, logarithms, calculator, and computer.

104. ELEMENTARY SURVEYING. Class 2, Lab. 3, cr. 3. Prerequisite or corequisite: MA 112, 150, or equivalent.

Measurement of distances, directions and angles, using the tape, level, compass, and transit. Computation of areas and traverses, lines and grades.

108. ROUTE SURVEYING AND DESIGN. Class 1, Lab. 6, cr. 3. Prerequisite: CET 104.

Preliminary and construction surveys for route location. Calculation and field work for simple and easement curves, grade lines, and slope stakes. Preparation of plans, profiles, and cross-sections from field survey data earthwork estimates.

160. STATICS. Class 3, cr. 3. Prerequisite: MA 154 or equivalent.

A study of forces acting on bodies at rest, including coplaner and noncoplanar forces, concurrent and nonconcurrent forces, friction forces, and hydrostatic forces. Centroids and moments of inertia are included. Practice in use of the slide rule will be included.

208. ROUTE SURVEYING. Class 1, Lab. 3, cr. 2. Prerequisite: CET 104.

Preliminary and construction surveys for highways and railroads, including simple, compound, reverse, and easement curves, super-elevation of curves, profiles, grade lines, slope stakes, yardage estimates, and mass and haul diagrams.

209. LAND SURVEYING AND SUBDIVISION. Class 1, Lab. 6, cr. 3. Prerequisite: CET 104.

Theory and practice of land surveying, subdivision, filing and recording deeds, United States governmental survey of public lands, laws of land surveying, descriptions and area computations for land surveys. Subdivision planning, calculations and plotting, water main layouts, storm and sanitary sewer calculations and layouts. Street plans and profiles.

253. HYDRAULICS AND DRAINAGE. Class 3, cr. 3. Prerequisite: MA 150.

Basic hydrostatics, Bernouilli's equation, flow in water and sewer lines, overland and ditch drainage, and culvert size determination.

260. STRENGTH OF MATERIALS. Class 3, cr. 3. Prerequisite: CET 160.

Study of stress-strain relationships, shear and bending moment diagrams, stresses and deflections of beams, axial loads, and combined stresses. Applied problems in the field of structural design.

262. STRENGTH OF MATERIALS I. Class 2, Lab. 3, cr. 3. Prerequisite: CET 160.

Study of stress-strain relationships of construction materials, connections, and shear and moment diagrams. Testing of materials to determine physical and mechanical properties.

The sequence CET 262-264 fulfills the requirement of CET 260-266.

264. STRENGTH OF MATERIALS II. Class 2, Lab. 3, cr. 3. Prerequisite: CET 262.

A study of bending stresses, beam deflections, column behavior, and combined stresses as applied to symmetric structural members. Tests of beams and columns to measure load-deflection relationships.

266. MATERIALS TESTING. Class 1, Lab. 6, cr. 3. Prerequisite: CET 260.

Testing of construction materials to determine physical and mechanical properties. Preparation of reports from data secured from such tests.

280. STRUCTURAL CALCULATIONS. Class 3, cr. 3. Prerequisite: CET 260.

Practice in the calculation of loads, reactions, shear, and moment for determinate structures. Introduction to indeterminate structures with emphasis on moment-distribution.

281. APPLIED STRUCTURAL DESIGN. Class 1, Lab. 6, cr. 3. Prerequisite: CET 260.

Standard design procedures for steel and wood frame structures. Computation of loads, shears, moments and deflections. Sizing of beams, columns, and connections. Preparation of structural drawings.

282. STRUCTURAL DETAILING. Class 1, Lab. 6, cr. 3. Prerequisites: CET 260 and ART 150.

Detailing simple structural steel, reinforced concrete and wood structures, elementary design principles.

299. CIVIL ENGINEERING TECHNOLOGY. Cr. 1-4. Hours to be arranged with the staff. Primarily for third and fourth semester students. Subject matter to be assigned by the staff.

UNDERGRADUATE LEVEL
Lower-Division Courses

366. MATERIALS TESTING II. Class 1, Lab. 6, cr. 3. Prerequisite: CET 266.
An introduction to testing structural elements and complete structures. Strain gauge measurements, instrumentation, and the design of tests to eliminate variables. Statistical analysis of test data.

368. EXPERIMENTAL STRESS ANALYSIS LAB. Class 1, Lab. 3, cr. 2. Prerequisite: CET 266.
Introduction to and application of the use of electrical strain gauges, brittle lacquers and photoelastic means of determining location, direction and magnitude of strains in scale and full-size structural systems and components.

380. STRUCTURAL DESIGN STANDARDS. Class 3, Lab. 3, cr. 4. Prerequisite: CET 280.
Standard design procedures for the selection of steel, concrete and wood members, including shear, moment, and compression criteria, with emphasis on the limitations of these procedures.

382. STEEL CONSTRUCTION. Class 2, Lab. 3, cr. 3. Prerequisite: CET 280.
Design of steel framed structures, including beams, columns, and connections. The preparation of structural drawings, and a study of erection practices.

384. WOOD CONSTRUCTION. Class 2, Lab. 3, cr. 3. Prerequisite: CET 280.
Design of wood frame construction and the formwork for concrete construction, including the preparation of structural and construction drawings.

386. REINFORCED CONCRETE CONSTRUCTION. Class 4, cr. 4. Prerequisite: CET 280.
A study of concrete both as a construction material and as a structural material. Field methods and practices used in concrete construction. Fundamentals of reinforced concrete design as applied to beams, slabs, columns, walls, and footings.

408. CONSTRUCTION OF HIGHWAYS. Class 1, Lab. 3, cr. 2. Prerequisites: CET 108 and 431.
Materials, design, and construction methods used in asphalt and concrete pavements. Preliminary layout and design of intersections. Design and construction of highway subgrades.

409. PROPERTY SURVEYING. Class 2, Lab. 3, cr. 3. Prerequisite: CET 209.
Office and field work associated with land surveying. Laws of land surveying, and public records of real property. Metes and bounds, federal subdivision, and state plane coordinate descriptions.

431. PROPERTY AND BEHAVIOR OF SOILS. Class 2, Lab. 3, cr. 3. Prerequisite: CET 260.
Identification and properties of soils with emphasis on laboratory and field testing. Behavior of soils relating to design and construction of structures and highways.

432. FOUNDATION CONSTRUCTION. Class 2, cr. 2. Prerequisite: CET 431.
Design and construction of shallow and deep foundations, excavating and bracing, and construction site dewatering.

499. CIVIL ENGINEERING TECHNOLOGY. Cr. 1-4.
Hours, subject matter, and credit to be arranged by staff. Course may be repeated for credit up to nine hours.

COMPUTER TECHNOLOGY (CPT)

Professor: (Calumet) J. Maniotes, Ph.D.

Associate Professors: (Calumet) A. J. Adams, M.S.I.E.; H. B. Von Horn, M.S.; (IUPUI) R. G. Crozier, Ph.D.; J. F. Dalphin, M.S.; N. J. Kira III, M.S.; P. M. McLear, M.S.; (North Central) L. F. Boness, M.B.A.

Assistant Professors: (Calumet) D. R. Kurtz, M.B.A.; J. S. Quasney, M.S.; S. M. Rados, M.S.E.E.; (Fort Wayne) C. E. Crosswhite, Ph.D.; J. T. Gorgone, M.A.; H. H. Henry, M.S.; D. E. Keck, M.S.; W. D. Osborn, M.S.; (IUPUI) G. T. Forget, M.S.; R. F. Randall, M.A.; J. G. Williams, Jr., B.S.; (North Central) W. H. Evans, M.S.; J. F. Gallagher, B.A.

Instructors: (Fort Wayne) V. A. Hanan, B.A.; W. C. Heller, B.A.; (IUPUI) B. S. Fox, B.S.; D. C. Fraser, B.S.

PERSONAL SERVICE COURSES

Students successfully completing personal service courses numbered 1-99 earn certificate units and not University credit.

64. INTRODUCTION TO COMPUTER PROGRAMMING. Class 1, Lab. 1, cert. units. 1.

The writing of programs to solve problems on the computer in the language FORTRAN. The laboratory period is used to process programs through the computer.

UNDERGRADUATE LEVEL

Lower-Division Courses

100. COMPUTER UTILIZATION. Class 3, cr. 3.

An introduction to data processing techniques through the use of unit record and highspeed computer equipment. Emphasis will be on how computers can assist the potential user.

101. INTRODUCTION TO COMPUTERS. Class 3, cr. 3.

An introduction to computers and data processing. The historical development of unit record equipment and electronic digital computers; a brief introduction to machine language, assembly language, FORTRAN, and COBOL programming; and a survey of computer applications.

111. UNIT RECORD DATA PROCESSING. Class 2, Lab. 2, cr. 3.

This course illustrates the concept, power, and flexibility of the unit record and the need for machines in accounting and record keeping. The importance and the scope of unit record equipment as an independent system will be developed throughout the course. Laboratory exercises will involve the card punch, verifier, sorter, interpreter, reproducing punch, collator, accounting machine, and calculator. Practical exercises offered will involve planning and wiring a range of unit record equipment and will be typical of those performed in the existing electronic accounting machine installations.

115. INTRODUCTION TO DATA PROCESSING. Class 4, Lab. 2, cr. 5. Not open to students with credit in CPT 116 or 117.

An introduction to computers and data processing. The historical development of unit record equipment and electronic digital computers; an introduction to unit record equipment, machine language, assembly language, compiler languages; and a survey of computer applications.

116. INTRODUCTION TO DATA PROCESSING I. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. CPT 116-117 is a two-semester version of CPT 115. Not open to students with credit in CPT 115.

117. INTRODUCTION TO DATA PROCESSING II. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Continuation of CPT 116. Not open to students with credit in CPT 115.

122. COMPUTER MATH. Class 3, cr. 3. Prerequisite: MA 147 or 150.

Selected topics in mathematics that are related to business and computer computations. Topics include: symbolic logic, binary, octal, and hexadecimal number systems; determinants; matrices; and linear systems.

131. ASSEMBLY LANGUAGE PROGRAMMING I. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisite: CPT 115 or 116.

Programming of a digital computer at the machine language and assembly language levels with emphasis on the meticulous step by step development of a program. Topics include: computer hardware, stored program concepts, operation codes, addresses, flow diagrams and assembly language translators. In the laboratory students write, process, and debug programs using the computer on an open shop basis.

132. ASSEMBLY LANGUAGE PROGRAMMING II. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisite: CPT 131.

Advanced symbolic programming techniques, programming exercises, and case studies are designed to familiarize the student with actual programming practices and to bridge the gap from the theoretical to the real world of data processing.

133. ASSEMBLY LANGUAGE PROGRAMMING I. Class 3, Lab. 2, cr. 4. Prerequisite: CPT 115 or 116.

Programming of a digital computer at the machine language and assembly language levels with emphasis on the meticulous step by step development of a program. Topics include: computer hardware, stored program concepts, operation codes, addresses, flow diagrams and assembly language translators. In the laboratory, students write, process and debug programs using the computer on an open-shop basis.

134. ASSEMBLY LANGUAGE PROGRAMMING II. Class 3, Lab. 2, cr. 4. Prerequisite: CPT 131 or 133.

Advanced symbolic programming techniques, programming exercises, and case

studies are included to familiarize the student with actual programming practices and to bridge the gap from the theoretical to the real world of data processing.

198. DATA PROCESSING PRACTICE I. Cr. 1.
Practice in industry with written reports of this practice for co-op students. May be repeated once.

200. COMPUTER PROGRAMMING FUNDAMENTALS. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3.

The presentation of the basic elements of programming digital computers. There is a treatment of absolute and symbolic coding, magnetic tape functions, and random access processing. Major emphasis will be on compiler language (FORTRAN) programming.

220. NUMERICAL ANALYSIS I. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisites: CPT 264 and MA 221.

Numerical methods necessary for finding solutions to mathematical equations and for analysis of tabulated data. A laboratory course consisting chiefly of the solution of specific problems by computer programming and other methods. Topics include: iterative and direct solutions of linear equations, matrix operations, integration techniques, and error analysis.

225. STATISTICAL METHODS. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Prerequisite or corequisite: CPT 264.

An introduction to elementary statistics with emphasis on the analysis of actual data. Topics include: description and representation of sample data, probability, theoretical distributions, sampling, estimating, correlation, regression, and computer statistical routines.

254. COMMERCIAL SYSTEMS APPLICATIONS. Class 3, cr 3, or Class 2, Lab. 2, cr. 3. Prerequisite: CPT 131 or CPT 133.

An introduction to commercial data processing principles and practices as related to computer-oriented systems. A study of the basic concepts, flowcharting, forms design, and writing of procedures for the major application areas including payroll, accounts receivable, accounts payable, and inventory control.

261. RPG PROGRAMMING. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3.

Computer programming using RPG, Report Program Generator. Study of the language structure, applications, and related utility programs.

264. FORTRAN PROGRAMMING. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisite: CPT 131 or CPT 133.

The structure and details of FORTRAN, a mathematically oriented compiler language. Numerous problems are solved on the computer to demonstrate the many facets of the language.

265. COBOL PROGRAMMING. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisite: a prior programming course.

A study of the programming language, COBOL, which is oriented toward data handling and processing tasks. The student will study the structure and details of COBOL and perform programming exercises as well as consider practical applications.

284. UTILITY PROGRAMS. Class 2, Lab. 2, cr. 3. Prerequisites: CPT 131 and 264.

This course is designed to familiarize the student with existing programs normally found in operating data processing centers. These include sort/merge routines, supervisory routines, report generators, random access utility programs, magnetic tape routines, etc.

286. COMPUTER OPERATING SYSTEMS I. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisite: CPT 131 or CPT 133.

An introduction to the computer operating systems and other systems software. Topics include: utility programs, job control monitors, program supervisors, loaders and link-editors.

290. COMPUTER PROJECT. Cr. 1-4.
Independent study for sophomore students who desire to execute a complete computer-oriented project. Course may be repeated for credit up to six hours.

294. COMPUTER SEMINAR. Class 2, cr. 1. Prerequisite: an introductory computer course.

Current problems and issues in the computer field. Field trips are required.

298. DATA PROCESSING PRACTICE II. Cr. 1.
Practice in industry with written reports of this practice for co-op students. May be repeated once.

299. COMPUTER TECHNOLOGY. Cr. 1-4.
Hours, credit, and subject matter to be arranged by staff. May be repeated for credit up to nine hours.

UNDERGRADUATE LEVEL
Upper-Division Courses

300. INTRODUCTION TO COMPUTERS. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3.

A broad survey of computers, data processing, and applications. Punched cards preparation, unit record equipment, computer hardware, and programming principles and languages. Applications emphasize how the computer is used as a tool to assist the user.

320. NUMERICAL METHODS II. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Prerequisites: CPT 220 and MA 222.

A continuation of CPT 220. Topics include: finite difference calculus, finite difference equations, differentiation techniques, and error analysis applied to these techniques.

340. DATA COMMUNICATIONS. Class 2, Lab. 2, cr. 3. Prerequisite: CPT 132.

The role of data communications in modern computation. Real time systems and data transmission. Topics include: terminal equipment, communication media, data codes, error detection and correction, and terminal software.

345. COMPUTER GRAPHICS. Class 2, cr. 2. Prerequisite: an introductory computer course.

A survey of computer hardware used to make graphic displays including printer, plotter, and cathode rays tube. Programming techniques for plotting lines and special symbols, the organization and representation of data, and a survey of applications.

354. MANAGEMENT INFORMATION SYSTEMS I. Class 2, Lab. 2, cr. 3. Prerequisites: CPT 254 and 265.

The processing of data in an integrated management information system environment with emphasis on the source, flow, dissemination, and interrelationship of data required for various operational areas of an industrial organization. The laboratory period is used for programming (in COBOL) and documentation of practical problems in management information systems.

360. PL/1 PROGRAMMING. Class 3, cr. 3. Prerequisites: CPT 264 and 265.

Detailed study of the PL/1 programming language and comparison of the language with COBOL and FORTRAN. Students will program representative applications in the PL/1 programming language.

364. TOPICS IN FORTRAN. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisites: CPT 264 and MA 222.

A continuation of CPT 264. Dialects of FORTRAN with emphasis on FORTRAN IV, FORTRAN compilers, computational methods, and applications in various technical and commercial areas.

367. APL PROGRAMMING. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Prerequisites: CPT 264 and MA 222.

Computer programming using APL, A Programming Language (Iverson). Study of the language structure and applications.

380. SYSTEMS ANALYSIS OF COMPUTER APPLICATIONS. Class 3, cr. 3. Prerequisite: CPT 254.

Total computerization of various applications. Case studies will be used to enforce those systems analysis techniques presented.

386. COMPUTER OPERATING SYSTEMS II. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3.

A continuation of CPT 286 with emphasis on systems generation, control languages, and time-sharing.

396. COMPUTER LABORATORY. Lab. 1-6, cr. 1-2.

Applied computer laboratory experiences carried out on an independent study basis in conjunction with other courses, assignments, or problems.

398. DATA PROCESSING PRACTICE III. Cr. 1.

Practice in industry with written reports of this practice for co-op students. May be repeated once.

444. HYBRID COMPUTING SYSTEMS. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisite: CPT 340.

Study of analog and hybrid computing systems. Topics will include: analog to digital and digital to analog conversion, process control systems, real-time monitoring.

454. MANAGEMENT INFORMATION SYSTEMS II. Class 3, cr. 3, or Class 2, Lab. 2, cr. 3. Prerequisite: CPT 354.

A continuation of the material presented in CPT 354, including topics in operations research.

480. COMPUTER SYSTEM PLANNING. Class 3, cr. 3. Prerequisites: CPT 354 and INDM 360.

The planning and design of computer

systems, including the formulation of corporate requirements, configuration of hardware to satisfy stated requirements, comparison and evaluation of equipment, installation considerations, and implementation procedures.

486. SYSTEMS PROGRAMMING. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisite: CPT 386.

Programming and maintenance of software packages. Software areas to be covered include operating systems, subroutine sets, assemblers and compilers, microprogramming.

490. SENIOR PROJECT. Cr. 1-4.

Independent study for seniors who desire to execute a complete computer oriented project. Course may be repeated for credit up to six hours.

498. DATA PROCESSING PRACTICE IV. Cr. 1.

Practice in industry with written reports of this practice for co-op students. May be repeated once.

499. COMPUTER TECHNOLOGY. Cr. 1-4.

Hours, credit, and subject matter to be arranged by staff. May be repeated for credit up to six hours.

CONSTRUCTION TECHNOLOGY (CNT)

D. D. Moss, in charge of curriculum and Head of the Department of Construction Technology

Assistant Professor: (IUPUI) R. T. Merz, M.S.

UNDERGRADUATE LEVEL
Lower-Division Courses

190. CONSTRUCTION OBSERVATION. Cr. 1.

Directed observation and inspection of construction work in progress on or near the campus. May be repeated twice.

198. CONSTRUCTION PRACTICE I. Cr. 1.

Practical experience in the construction industry with written reports of this experience for co-op students.

280. QUANTITY SURVEY AND ESTIMATING. Class 2, Lab. 3, cr. 3. Prerequisite: ART 150.

A study of methods to estimate quantities of materials required in construction. Practice in making quantity surveys. Introduction to estimating labor and costs.

298. CONSTRUCTION PRACTICE II. Cr. 1.

Practical experience in the construction industry with written reports of this experience for co-op students.

UNDERGRADUATE LEVEL
Upper-Division Courses

340. CONSTRUCTION SCHEDULING. Class 2, cr. 2.

A study of the planning and control of construction projects. Time schedules for materials, labor, and equipment; expediting material delivery; bar charts; and CPM scheduling.

344. CONSTRUCTION INSPECTION. Class 2, Lab. 3, cr. 3. Prerequisite: ART 276.

Inspection procedures as applied to contracted construction, and the role inspection plays in the execution of the completed contract. The laboratory period is for field trips to construction sites.

390. CONSTRUCTION EXPERIENCE. Cr. 1.

Minimum of ten weeks work experience in the construction industry, with at least five weeks experience in the field. Written report of this experience.

398. CONSTRUCTION PRACTICE III. Cr. 1.

Practical experience in the construction industry with written reports of this experience for co-op students.

441. CONSTRUCTION OPERATIONS. Class 4, cr. 4. Prerequisite: junior or senior standing.

Management, methods and equipment used in the construction of buildings, earthworks, bridges and roads. Contractor organization, job management, and safety. Excavation, formwork, concrete, masonry, and steel erection methods.

442. CONSTRUCTION COSTS AND BIDDING. Class 2, Lab. 3, cr. 3. Prerequisites: CNT 280 and 441.

Estimating total job costs, and the study of bidding practices of the construction industry. Topics include: unit costs of

materials and labor, quantity survey, overhead, subcontracts, total estimated costs, and bid price. The laboratory period is for the development of costs for an actual job.

445. CONSTRUCTION MANAGEMENT. Class 3, cr. 3. Prerequisite: INDM 200.

Business policy and problems as they relate to construction companies. Contractors' organization, financial management, project management, supervision, cost analysis, and equipment economics.

498. CONSTRUCTION PRACTICE IV. Cr. 1.

Practical experience in the construction industry with written reports of this experience for co-op students.

499. CONSTRUCTION TECHNOLOGY. Cr. 1-4.

Hours, subject matter and credit to be arranged by staff. Course may be repeated for credit up to nine hours.

ELECTRICAL ENGINEERING TECHNOLOGY (EET)

G. L. Rainey, Head of the Department

Professors: (Calumet) R. L. Anderson, B.S.; L. E. Brunner, M.S.; (Fort Wayne) D. E. Nold, M.S.E.; (West Lafayette) G. L. Rainey, M.S.E.E.

Professor Emeritus: (West Lafayette) M. D. Roberts, M.S.

Associate Professors: (Calumet) J. C. Rapal, M.Ed.; K. H. Steiner, M.; (Fort Wayne) R. C. Emery, M.S.E.E.; H. W. Gates, M.S.; F. R. Gideon, M.S.; H. C. Nordlin, M.S.E.E.; (IUPUI) F. E. Burley, M.S.E.E.; B. J. Keller, M.S.; M. A. Needler, Ph.D.; P. K. Sharp, M.S.E.E.; R. E. Warren, M.S.; (Kokomo) N. S. Poulton, M.S.E.E.; (West Lafayette) V. W. Hoeche, M.Ed.; R. C. Hubele, M.S.; C. E. Lentz, M.S.

Assistant Professors: (Calumet) Sin-Ban Jen, M.S.; B. Z. Jovanovich, M.S.; H. I. Lee, B.S.E.E.; C. E. Miller, Ph.D.; W. W. Reed, Jr., B.S.; C. R. Sekhar, M.S.E.E.; N. M. Detraz, M.S.E.E.; (IUPUI) R. M. Messinger, M.S.; D. E. Smith, M.S.; T. K. Willison, M.S.; (Kokomo) W. H. Hubbard, M.S.; M. T. O'Hair, M.S.; (North Central) W. L. Stoakes, M.S.E.E.; (West Lafayette) S. R. Cheshier, M.S.E.E.; W. R. Naylor, M.S.; G. A. Rath, M.S.E.; W. F. Reeve, M.S.; W. J. Sensing, M.S.

Instructor: (Calumet) R. L. Schneider, B.S.E.E.

PERSONAL SERVICE COURSES

Students successfully completing personal service courses numbered 1-99 earn certificate units and not University credit.

9. LABORATORY V. Lab. 2, cert. units 1. Corequisites: EET 64, 72, and 80.

Part I of two parts. Laboratories series designed to complement the materials of equipping courses.

10. LABORATORY VI. Lab. 2, cert. units 1. Prerequisite: EET 9; corequisites: EET 65, 73, and 81.

Part II of two parts. Continuation of EET 9.

15. BASIC ELECTRICITY. Class 2, Lab. 4, cert. units 4.

Basic electrical terms, units, symbols, and schematics are discussed. Equipment such as voltmeters, ohmmeters, ammeters, generators, and oscilloscopes are demonstrated. Magnetism, inductance, capacitance series and parallel circuits are considered. Basic principles of alternating current, capacitive reactance, inductive reactance, impedance, phrasors, power factor, and resonance are studied.

16. BASIC ELECTRICITY I. Class 1, Lab. 2, cert. units 2.

A course in basic electricity that is designed primarily for the air-conditioning, heating, and refrigeration program. Basic electrical terms, units, symbols, components, schematics, Ohm's Law, series circuits, parallel circuits, magnetism, inductance, and capacitance are studied. The use of measuring and test instruments such as voltmeters, ohmmeters, and ammeters is stressed in the practical laboratory.

17. BASIC ELECTRICITY II. Class 1, Lab. 2, cert. units 2.

A continuation of EET 16, which is designed primarily for the air conditioning, heating, and refrigeration program. Basic principles of alternating current, motors, generators, transformers, fuses, disconnects, relays, pressure cutouts, starters, temperature controls, and pressure controls are studied. The practical lab-

oratory stresses measurements and trouble shooting.

23. TRANSISTOR AND VACUUM TUBE FUNDAMENTALS. Class 2, Lab. 4, cert. units 4.

Transistor fundamentals, semiconductor diodes, vacuum tube diodes, triodes, tetrodes, pentodes are discussed. The use of oscilloscopes, audio oscillators, and voltmeters in electronic circuits such as amplifiers, power supplies, and oscillators is considered.

24. UNDERSTANDING YOUR RADIO AND TV. Lab. 2, cert. units 1 (15 weeks).

Introduction to basic electronics. Circuit analysis, troubleshooting and repair of radio, television, and allied equipment. Previous experience unnecessary.

33. APPLIED ELECTRONICS. Lab. 2, cert. units 1 (15 weeks). Prerequisite: EET 24.

Basic principles, analysis, troubleshooting, and repair of common circuits which are used in radio, television, industrial controls, and computers. "Bench work" will be stressed with emphasis on the proper use of test equipment.

36. ELECTRICAL BLUEPRINTS AND DIAGRAMS. Cert. units 4.

A study of blueprints and diagrams related to electrical systems and controls normally used in steel mills.

38. DC CIRCUITS. Class 3, Lab. 2, cert. units 4.

A brief consideration of direct current circuit theory and application consistent with modern steel mills requirements.

39. ELECTRONIC CIRCUITS. Class 2, Lab. 4, cert. units 4.

Transistors and vacuum tubes used in circuits are considered. Power supply circuits, audio amplifiers, RF amplifiers, oscillators, modulation, AM transmitters and receivers, FM transmitters and receivers are discussed. Special electronic circuits such as clippers, clampers, multivibrators, blocking oscillators, sweep circuits are studied. Trouble shooting techniques are emphasized.

40. DC CIRCUITS AND MACHINES. Class 3, Lab. 2, cert. units 4.

DC machines and apparatus from the viewpoint of construction details, industrial application, and methods of operation.

41. ELECTRONIC CONTROL CIRCUITS. Class 2, Lab. 4, cert. units 4.

Rotating electrical machinery and control circuits, servomechanism components such as error detectors, amplifiers, detectors, magnetic amplifiers are considered. Specialized electronic control circuits are discussed.

45. COMMUNICATIONS ELECTRONICS. Class 2, Lab. 4, cert. units 4.

Principles of television, UHF, microwaves, transmitters and receivers, FCC exam information, trouble shooting techniques are considered.

51. ELECTRONIC INSTRUMENTATION AND SYSTEMS. Class 2, Lab. 4, cert. units 4.

Study of electronic instruments, recorders, controllers, sensing devices, transducers used in open and closed loop systems, maintenance, trouble shooting, adjustment, and calibration is stressed.

52. AC CIRCUITS. Class 3, Lab. 2, cert. units 4. Prerequisite: EET 40.

Nature of alternating current, methods of generation, single-phase currents, polyphase currents; practical concepts of power, power-factor, reactive factor, reactance, and impedance; simple AC circuit calculations.

56. BASIC ELECTRONICS AND ELECTRICAL CIRCUITS. Class 2, cert. units 2.

Practical fundamentals of electrical circuits and electronics.

60. AC MACHINES. Class 3, Lab. 2, cert. units 4. Prerequisite: EET 52.

Construction details and practical performance of transformers, induction motors, alternators, synchronous motors, rectifiers, and other common alternating current apparatus.

64. POWER DISTRIBUTION AND PROTECTIVE RELAYING I. Class 1, cert. units 1. Prerequisite: EET 60 or equivalent.

Part I of two parts. Emphasis on industrial power systems function and protection.

65. POWER DISTRIBUTION AND PROTECTIVE RELAYING II. Class 1, cert. units 1. Prerequisite: EET 64.

Continuation of EET 64. Industrial power systems, function, and protection.

68. MOTOR CONTROL. Class 3, cert. units 3.

Application of controllers for electric motors used in the steel industry.

72. AUTOMATION: DEVICES. Class 3, cert. units 3. Prerequisites: EET 60 and 76, or equivalent.

Operation principles of regulations and control system components.

73. AUTOMATION: SYSTEMS. Class 2, cert. units 2. Prerequisite: EET 72.
Study of selected processes, control, and loop systems.

76. BASIC ELECTRONICS. Class 3, cert. units 3.
A survey of electronics as it applies to controls used in industry.

78. ELECTRICAL MAINTENANCE AND BLUEPRINTS. Class 3, Lab. 2, cert. units 4.
Discussions on scheduled inspection programs, trouble shooting, and preventive maintenance equipment used in the steel mill.

80. ELECTRONICS: TUBES AND INDUSTRIAL APPLICATIONS. Class 2, cert. units 2. Prerequisite: EET 76 or equivalent.
Review of electronics with extended emphasis on industrial circuits.

81. TRANSISTORS AND SOLID STATE DEVICES. Class 2, cert. units 2. Prerequisite: EET 80.
Semiconductor principles, characteristics, and applications.

92. INDUSTRIAL ELECTRONICS. Class 2, cert. units 2.
Principles of operation and industrial applications of the common types of vacuum and gas tubes, photoelectric cells, and cathode ray tubes.

93. TECHNICAL ADVANCEMENTS. Class 1, cert. units 1. Corequisites: EET 65 and 73.
Selected topics in sciences and technology.

UNDERGRADUATE LEVEL
Lower-Division Courses

100. INTRODUCTORY ELECTRICAL ENGINEERING TECHNOLOGY. Class 4, cr. 4. Prerequisite or corequisite: MA 150.
Fundamentals of DC and AC electricity, magnetism, electromagnetism, wave motion, sound, and light.

101. ELECTRICAL CIRCUITS I. Class 3, cr. 3. Prerequisite or corequisite: MA 150.
A study of DC electrical circuits, Ohm's Law, Kirchhoff's Laws, series and parallel circuits, power, introductory magnetism, ammeters, voltmeters, ohmmeters, inductance, capacitance, and an introduction to alternating voltages, currents, and reactances.

103. ELECTRONICS I. Class 2, cr. 2. Prerequisite or corequisite: EET 101 or consent of instructor.
Orientation topics on departmental and university services and industrial careers. Field trips related to career fields may be required.

An introduction to conductors, semiconductors, insulators and the physical construction and elementary operation of electron tubes, solid-state diodes, and transistors. Includes characteristic curves and properties related to DC load lines.

106. INTRODUCTION TO COMPUTER FUNDAMENTALS. Class 3, cr. 3.
Reviews direct current and alternating current concepts and vacuum tube fundamentals. Surveys vacuum tube circuits, rectifiers, simple amplifiers, and fundamental oscillators. Review theory of transistors, basic transistor and semiconductor circuits, rectifiers, amplifiers, and oscillators. Deals with special types of transistors and bistable and multivibrator circuits. Introduces logic in electrical circuits, binary arithmetic. Boolean algebra, and the electronic flipflop circuit. Surveys binary counting circuit, ring circuits for timing, simple memory, analog arithmetic operations components, rheostats, synchros, and resolvers. Reviews analog to digital conversion circuits and input and readout devices.

113. ELECTRICAL ENGINEERING TECHNOLOGY LABORATORY I. Lab. 6, cr. 2. Prerequisites or corequisites: EET 101 and 103.
The first of a sequence of practical laboratory courses designed to develop technical skills and techniques in circuit construction, instrument operation, testing, measuring, troubleshooting, and circuit analysis. Instruments such as ammeters, voltmeters, ohmmeters, DC bridges, and oscilloscopes are used in DC and AC circuits.

151. ELECTRICAL CIRCUITS II. Class 3, cr. 3. Prerequisites: EET 101 and 113; corequisite: EET 163.
A study of DC and AC electrical circuits, network theorems, j operator, phasors, reactances, impedances, phase relationships, power, resonance, ideal and air-core transformers and an introduction to graphical techniques and transients.

153. ELECTRONICS II. Class 3, cr. 3. Prerequisites: EET 101, 103, 113, and MA 150; prerequisites or corequisites: EET 151 and 163.
A study of the characteristics and applications of transistors, integrated circuits, and other solid-state devices. Includes rectifier circuits, waveform interpretation, AC and DC load lines, biasing techniques, equivalent circuits, single and multi-stage class A small-signal amplifiers, and h parameters.

163. ELECTRICAL ENGINEERING TECHNOLOGY LABORATORY II. Lab. 6, cr. 2. Prerequisite or corequisite: EET 153.

The second of a sequence of practical laboratory courses designed to develop technical skills and techniques in circuit construction, testing, instrument operation, measuring, troubleshooting and circuit analysis. Experimental work on transistor and electron tube circuits, DC and AC networks, and electromechanical devices; using ammeters, voltmeters, wattmeters, oscilloscopes, signal generators, wavemeters, frequency meters, and bridges.

203. ELECTRONICS III. Class 3, cr. 3. Prerequisites: EET 151, 153, 163, and MA 221; corequisite: EET 213.

A study of the applications of transistors, integrated circuits, and other solid-state devices. Feedback principles as applied to amplifiers, oscillators, and regulated power supplies. Includes large-signal power amplifiers, special-purpose amplifiers, and AM and FM modulation and detection techniques. Introduction to filters as applied to tuned amplifiers and rectifier circuits.

211. ELECTRICAL POWER AND MACHINERY. Class 3, cr. 3. Prerequisites: EET 151 and 163.

A study of power transformers, single and polyphase circuits, and an introduction to the National Electric Code. The study of DC machines and AC single and polyphase synchronous and induction machines.

213. ELECTRICAL ENGINEERING TECHNOLOGY LABORATORY III. Lab. 6, cr. 2. Prerequisites: EET 203 and 211.

The third of a sequence of practical laboratory courses designed to develop technical skills and techniques in circuit construction, testing, instrument operation, measuring, troubleshooting, and circuit analysis. Experimental work and measurements on power supply circuits, filters, receivers, transmitters, electrical machines, waveshaping circuits, sweep circuits logic circuits and commercial equipment and selected experiments from the student's specialty.

214. ELECTRICITY FUNDAMENTALS. Sem. 1 and 2. Class 1, Lab. 4, cr. 2 (3 IED).

An introduction to the fundamentals of electricity; characteristics, operation, function and testing of basic electrical circuits.

216. ELECTRICAL MACHINES AND CONTROLS. Class 3, cr. 3. Prerequisites: MA 150 and GNT 176 or equivalent.

Lecture, recitation, and demonstration are combined to acquaint the student with the elements of electrical circuits and machines as they are applied as component parts of machine drives and controls within the requirements of the National Electrical Code and in conformity to the ratings and dimensional specifications of NEMA. Manufacturers catalogs and pamphlets are used freely as classroom aids.

250. CIRCUIT SYSTEMS ANALYSIS. Class 2, Lab. 2, cr. 3. Prerequisite: EET 205.

Continuation of EET 205, Circuit Fundamentals.

253. ELECTRONICS IV. Class 3, cr. 3. Prerequisites: EET 153, 163, and MA 222; corequisite: EET 263.

A study of transients, waveshaping techniques, switching circuits, multivibrators, logic gates, triggering and synchronizing techniques, binary arithmetic, and introductory Boolean algebra. Includes diodes, transistors, and integrated circuits in pulse and digital applications such as shift registers and ring counters.

263. ELECTRICAL ENGINEERING TECHNOLOGY LABORATORY IV. Lab. 3, cr. 1. Prerequisite or corequisite: EET 253.

Selected experiments to provide a broad technical background. Experiments are selected from specialty areas such as communications, electrical power, television, computers, medical electronics, automatic controls, and aviation electronics.

UNDERGRADUATE LEVEL
Upper-Division Courses

301. ELEMENTS OF MACHINE CONTROL. Class 3, cr. 3. Prerequisite: EET 211.

The study of AC and DC machine controls. Includes relays, protective relays, circuit breakers, controllers, and contactors.

302. ELECTRO-MECHANICAL CONTROL COMPONENTS. Class 3, cr. 3. Prerequisites or corequisites: EET 203 and 211.

A study of the components in open-loop and closed-loop systems. Included are sensing devices, error detectors, potentiometers, synchros, resolves, modulators, demodulators, amplifiers, motors, generators, and networks. An analysis course that stresses operation, time- and frequency-response characteristics, and proper adjustment of the components.

303. COMMUNICATIONS I. Class 3, cr. 3. Prerequisites: EET 203, 213, and MA 222.

A study of AM and FM modulation and detection, receivers, transmitters, networks, filters, antennas, and transmission lines through the VHF frequency spectrum.

306. TELEVISION I. Class 3, cr. 3. Prerequisites: EET 203 and 213.

A study of television transmission and receiving systems. Includes analysis of transmitted signal, FM, video amplifiers, power supplies, synchronization, deflection alignment and antennas.

307. PULSE AND DIGITAL CIRCUITS. Class 3, cr. 3. Prerequisite: EET 253.

A study of basic analog and digital devices and circuits, arithmetic operations, binary codes and combinational digital logic simplification techniques.

321. GENERATION AND TRANSMISSION OF ELECTRICAL POWER. Class 3, cr. 3. Prerequisite: EET 211.

A study of the generation and transmission of electrical energy. Includes techniques used by electric utilities for the protection of generating equipment and transmission lines, an introduction to the economic considerations of power plant operation, and three-winding transformers and methods of solving unbalanced three-phase systems.

322. ELECTRICAL CIRCUITS, CONTROLS, AND ROTATING EQUIPMENT. Sem. 1 and 2. Lab. 6, cr. 2 (5 IED, teaching option). Prerequisite: EET 214.

An introduction to types of non-electronic equipment as found in the home and industrial arts laboratory. Emphasis will be placed upon construction, function, operation, maintenance, and application of circuits, controls, and machines.

351. AUTOMATED POWER REGULATION SYSTEMS. Class 3, cr. 3. Prerequisite or corequisite: EET 211.

A study of systems used to control and regulate speed, torque, voltage, horsepower, frequency, etc., in heavy power equipment. Includes basic ideas of feedback loop; applications of rotating amplifiers such as Amplidyne, Rototrol, and others; magnetic amplifiers; and an introduction to solid-state control systems.

352. ELECTRONICS APPLICATIONS. Class 3, cr. 3. Prerequisites: EET 203, 213, and MA 222.

A study of the applications of the fundamental electrical and electronic circuits in various specialty areas. Includes selected topics such as oscillators, synchronizing and sweep circuits, high-voltage power supplies, wide-band amplifiers, closed-loop feedback systems, transmission lines, UHF, VHF, radar, digital circuits, medical electronics, magnetic amplifiers, transducers, display devices and lasers.

354. ELECTRONIC INSTRUMENTATION. Class 3, cr. 3. Prerequisites or corequisites: MET 384 and EET 253.

A study of the electronic instruments and control systems used in the manufacturing and process industries for measurement and control of temperature, fluid flow, level, humidity, and physical dimension. Includes the analysis, operation, and calibration of sensing devices, recorders, controllers, analyzers, and counters that use vacuum tubes and semiconductor devices.

356. TELEVISION II. Class 3, cr. 3. Prerequisite: EET 306.

A continuation of EET 306. A study of color transmitters and receivers. Principles of color vision, color combination, chromaticity, picture tubes, and receiver circuits.

361. ELECTRICAL POWER BLUEPRINTS AND DRAFTING. Class 1, Lab. 3, cr. 2. Prerequisite or corequisite: EET 211.

Various types of power system blueprints and drawings related to the normal practices of representation of bus systems, substations, transmission, distribution arrangements, etc., to familiarize the student with current practice in the reading of power blueprints and diagrams.

363. FCC EXAM PREPARATION. Class 1, cr. 1. Prerequisite: consent of instructor.

Review of electrical and electronic theory and the study of rules and regulations of the Federal Communications Commission to prepare for the first and second class FCC license. The FCC license is required for the operation and maintenance of many types of communications, broadcast, industrial, and aviation equipment.

364. ELECTRICAL MEASUREMENTS. Class 3, cr. 3. Prerequisite or corequisite: EET 253.

An advanced study of electrical instruments used to measure electric and non-electric quantities. Explains instrument limitations, calibration procedures, possible errors, and industrial applications. Includes the analysis of precision voltmeters, ammeters, AC and DC bridges, potentiometers, and frequency standards.

366. TRANSISTORS AND SEMICONDUCTOR DEVICES. Class 3, cr. 3. Prerequisites: EET 203, 213, and MA 222.

A study of solid-state diodes, controlled rectifiers, transistors, characteristic curves, bias techniques, parameters, equivalent circuits, small-signal amplifiers, power amplifiers, oscillators, and linear integrated circuits.

371. ELECTRICAL MACHINERY LABORATORY. Class 1, Lab. 3, cr. 2. Prerequisites or corequisites: EET 301 and 321.

A laboratory course associated with the machinery courses to integrate the presentation and to instruct the student in the construction, testing, and operation of the equipment.

372. CONTROL LABORATORY. Class 1, Lab. 3, cr. 2. Prerequisites or corequisites: EET 352 and 362.

A practical laboratory course that stresses testing, circuit analysis, adjustment, calibration, instrument operation, measuring, and troubleshooting. Experimental work on typical industrial devices, circuits, and systems such as DC power supplies, timing circuits, synchros, transistor amplifiers, magnetic amplifiers, control components, and experimental servomechanisms.

373. COMMUNICATIONS LABORATORY. Class 1, Lab. 3, cr. 2. Prerequisite or corequisite: EET 353.

A practical laboratory course that stresses testing, circuit analysis, adjustment, calibration, operation, measuring, and troubleshooting. Experimental work on circuits, receivers, transmitters, networks, filters, and UHF measuring equipment.

374. INSTRUMENTATION LABORATORY. Class 1, Lab. 3, cr. 2. Prerequisites or corequisites: EET 354 and 364.

A practical laboratory course that stresses instrument construction, precision calibration, testing, and troubleshooting. Includes experiments in the measurement, recording, and control of temperature, fluid flow, and strain. Techniques used in instrument-calibration laboratories are stressed.

376. ELECTRONIC TROUBLESHOOTING LABORATORY. Class 1, Lab. 3, cr. 2. Prerequisite or corequisite: EET 213.

Experimental work in analyzing and repairing equipment. The use of test instruments to locate faulty components in AM and FM receivers, television, and industrial circuits.

381. CONTROL OF ELECTRIC MOTORS. Class 3, cr. 3.

A specialized study of the control of speed, acceleration, stopping, plugging, reversing, cycling, etc., of AC and DC motors in heavy industry applications.

383. ADVANCED ELECTRICAL NETWORKS. Class 3, cr. 3. Prerequisites or corequisites: EET 213 and MA 222.

An advanced course in network analysis that stresses network theorems, solutions of time- and frequency-domain problems.

386. TELEVISION LABORATORY. Class 1, Lab. 3, cr. 2. Prerequisite or corequisite: EET 356.

A practical laboratory course that stresses circuit analysis, adjustment, testing operation, and troubleshooting techniques. Experimental work on commercial television equipment.

396. ELECTRICAL TECHNOLOGY. Class 2-4 and/or Lab. 3-9, cr. 1-7. Hours as arranged with staff. Special studies in electrical technology.

Primarily for students who have completed the requirements for the degree of Associate in Applied Science.

The primary objective of this course is to provide the advanced student with the opportunity to select and develop individual projects under the supervision of the staff. The student makes use of the knowledge and the many techniques acquired in the basic two-year technology curriculum.

402. ELECTRICITY IN THE HOME. Sem. 2. Class 1, Lab. 6, cr. 3 (7 HE).

Common household electrical problems, with emphasis on lighting, residential wiring, and the operation, structure, design and care of electrical appliances.

407. ANALOG AND DIGITAL CIRCUITS. Class 3, cr. 3. Prerequisites: EET 307 and 383.

A study of analog and digital devices; flip-flops, counters, shift registers, linear devices, multipliers, dividers, analog circuits, memory systems, and sequential circuit analysis and synthesis.

415. MEDICAL ELECTRONICS. Class 2, Lab. 2, cr. 3.

A survey covering the fundamental concepts of electricity and electronics as they relate to the medical field. Emphasis will be placed upon the safe and effective operation of electrical and biomedical electronic equipment.

423. ELECTRONICS FUNDAMENTALS. Sem. 1 and 2. Class 2, Lab. 3, cr. 3. (7 IED, teaching option.) Prerequisite: EET 214.

Function and characteristics of vacuum tubes and transistors. Operation and analysis of basic electronic circuits. Methods of troubleshooting and servicing electronic equipment, including radio and television receivers.

433. ELECTRONICS AND INDUSTRIAL CONTROLS. Class 2, Lab. 3, cr. 3. (7 IED, industrial option.) Prerequisite: EET 214.

Familiarization with electronics as applied to industry. Basic theory and application of electronics to controls for industrial equipment and data processing.

453. COMMUNICATIONS II. Class 3, cr. 3. Prerequisites: EET 303 and 383.

A study of high frequency systems (1 meter or less) and microwave technology to familiarize the student with the fields of radar, facsimile, television, transmission lines, antennas, propagation, wave guides and cavities, and measuring equipment.

462. AUTOMATIC CONTROL SYSTEMS. Class 3, cr. 3. Prerequisite: EET 383.

The transfer function approach to the study of feedback control systems. Stability criteria are examined. Uses of Nichols charts, Bode diagrams and root-locus plots to predict performance are studied. Analog and digital simulation is introduced and various techniques are applied to selected industrial control systems.

499. ELECTRICAL ENGINEERING TECHNOLOGY. Class 0-4, Lab. 3-9, cr. 1-9.

Hours and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

GENERAL STUDIES (GNT)

Denver Sams, Acting Head of the Department

Professors: (Calumet) T. D. Sherrard, M.A.; (North Central) R. F. Schwarz, M.S., (West Lafayette) D. R. Smith, Ph.D.

Assistant Professor: (IUPUI) E. R. Cox, B.S.

PERSONAL SERVICE COURSES

Students successfully completing personal services courses numbered 1-99 earn certificate units and not University credit.

6. READING IMPROVEMENT. Lab. 3, cert. units 1.

Helps students become more accurate and orderly in their reading. It furnishes the basic for good comprehension. Tachistoscopic and film materials are used.

7. VOCABULARY BUILDING. Lab. 3, cert. units 1.

Development of vocabulary through study of the characteristic of the language, usage, and word formation; exercises and dictionary practice; selected readings.

8. COMMUNICATION SKILLS. Class 3, cert. units 3.

A basic course designed to develop competence in written expression.

9. GENERAL COMMUNICATION SKILLS. Class 5, cert. units 5.

Emphasizes reading, writing, speaking, listening, and thinking as integrated elements of communication. The course aims to develop competence in communication skills necessary for college work and the practical needs of business and industry.

12. STUDY SKILLS. Class 1, cert. units 1.

Procedures and practices for the development of good study habits. Includes techniques for better listening, notetaking, textbook reading, time budgeting, and writing themes and reports.

20. TESTING, SELF-ANALYSIS, AND COUNSELING. Class 1, Lab. 3, cert. units 2.

Students take, score, and analyze results of selected objective tests. Each test is studied to determine its objectives, reliability and validity. Each student will develop a profile of himself based on what he learns from the tests.

40. PHYSICS: MECHANICS, HEAT, AND ELECTRICITY. Class 3, cert. units 3. Prerequisite: GNT 60.

Basic principles of mechanics, properties of materials, and selected elements of heat related to practical applications in steel mills. Includes units, vectors, torque,

velocity and acceleration, force and motion, rotation of rigid bodies, uniform circular motion, friction, work and power, energy momentum, elastic properties of solids, liquids at rest, fluids in motion, properties of gases, and selected elements of heat. Emphasis on vectors, torque, and elastic properties of solids.

52. PHYSICS: MECHANICS AND ELECTRICITY. Class 4, cert. units 4.

Basic principles of mechanics and selected elements of electricity and magnetism. Basic principles are related to practical applications in steel mills. Covers vectors, torque, velocity and acceleration, force and motion, friction, work and power, energy, rotation of rigid bodies, momentum, uniform circular motion, vibratory motion, elastic properties of solids, liquids, fluids in motion, properties of gases, molecular theory of matter, static electricity, DC circuits, electrical energy and power, magnetism, electromagnetic induction, transformers, generators and motors, capacitance, alternating currents, and rectifiers.

54. INTRODUCTION TO GOVERNMENT. Class 3, cert. units 3.

A basic course in the development of government in the United States. Other democratic governments in the world are also included.

60. APPLIED MATHEMATICS III. Classes 1-5, cert. units 1-5.

Fundamental concepts and techniques of algebra and trigonometry necessary for related courses and work.

UNDERGRADUATE LEVEL

Lower-Division Courses

110. IMPROVING STUDY TECHNIQUES. Class 1, cr. 1.

Emphasis is on taking and using notes; effective participation in class discussions; time management; using texts; predicting test questions; preparing for and taking examinations; knowing what and how to memorize; improving concentration; getting help from professors; and self-evaluation of progress in a course.

136. PHYSICS: MECHANICS AND HEAT. Lect. 2, Rec. 2, Lab. 2, cr. 4. Prerequisites or corequisites: MA 111 and 112 or 150.

Work, energy, power, efficiency of simple machines; equilibrium conditions for solids, liquids, and gases; straight line and rotational motion. Elementary principles of heat and their technical applications.

176. PHYSICS: ELECTRICITY, SOUND, AND LIGHT. Lect. 2, Rec. 2, Lab. 2, cr. 4. Prerequisite: GNT 136.

Fundamental principles of electricity, wave motion, sound, and light.

220. TECHNICAL REPORT WRITING. Class 3, cr. 3.

Extensive application of the principles of good writing in industrial reporting, with emphasis on the techniques of presenting information graphically as well as in a clear, concise written form.

250. APPLIED CREATIVITY FOR BUSINESS AND INDUSTRY. Class 3, cr. 3.

A study of the ways individuals can become more creative and how they can develop an environment which encourages creativity from employees.

INDUSTRIAL EDUCATION (IED)

Max Eddy, Head of the Department

Professors: (West Lafayette) J. J. Carrel, Ed.D.; Max Eddy, Ed.D.; D. L. Householder, Ed.D.; W. H. Mason, Ed.D.; Denver Sams, Ed.D.; A. R. Suess, Ed.D.

Professors Emeriti: (West Lafayette) H. S. Belman, M.A.; C. E. Highlen, M.Ed.; W. B. Hill, B.S.

Associate Professors: (Calumet) A. J. Parker, M.S.Ed.; (Fort Wayne) F. L. Bushong, M.S.; (IUPUI) Edgar Fleenor, M.A.; (West Lafayette) H. W. Bennett, M.S.; H. E. McVicker, Ed.D.; L. D. Neher, Ed.D.; J. A. Nieminen, Ed.D.; W. A. Stanton, Ed.D.

Assistant Professors: (West Lafayette) N. W. Sievert, Ed.D.; D. N. Wheeler, Ph.D.; J. L. Wircenski, Ed.D.

PERSONAL SERVICE COURSES

Students successfully completing personal service courses numbered 1-99 earn certificate units and not University credit.

18. MACHINE WOODWORKING. Lab. 3, cert. units 1 (12 weeks).

A basic course in the safe operation of the common woodworking machines. Class activities will include planning, construction, and finishing of *small* projects in wood. Instruction in any special operations on the machines will be available. Previous experience unnecessary.

24. CREATIVITY IN THE GRAPHIC ARTS. Lab. 3, cert. units 1 (12 weeks).

An elementary course in graphic arts for avocational interests. Activities include hand cut and photo silk screen reproduction and letterpress printing with ample time for creativity with the various techniques. Previous experience unnecessary.

UNDERGRADUATE LEVEL

Lower-Division Courses

110. INTRODUCTION TO INDUSTRIAL EDUCATION. Class 1, cr. 1.

Overview of industrial education with emphasis upon its function and structure in industry and the public school.

111. INTRODUCTION TO MATERIALS AND PROCESSES OF INDUSTRY. Class 2, Lab. 2, cr. 3.

A survey of both the established and newer industrial materials and processes with applications to current products. Emphasis is placed on the development, nature, and characteristics of materials as they affect industrial processes and the importance of manufacturing and its relationships to other phases and activities of the modern industrial complex. Field trips are a requirement.

125. BASIC METAL PRACTICES. Class 1, Lab. 4, cr. 3. (Not open to students in industrial arts teaching.)

The application of basic machine tools and common metalworking hand tools to elementary problems in metals processing and fabrication. A survey of properties and applications of common metals alloys.

199. SELECTED TOPICS FOR VOCATIONAL TEACHERS IN SERVICE. Cr. 1-8. May be repeated to a total of eight credits.

Designed primarily for conditionally certified vocational teachers for development and improvement of basic teaching skills and license upgrading.

210. FOUNDATIONS OF INDUSTRIAL ARTS. Class 3, cr. 3.

A study of traditional and contemporary philosophy, theory, and practice in industrial arts, with emphasis upon the role of industrial arts in contemporary American education.

211. INDUSTRIAL ARTS MATERIALS AND PROCESSES. Class 1, Lab. 4, cr. 3.

An orientation to the processing of materials to provide foundational understandings basic to the laboratory courses in the industrial arts teaching major. Emphasis is placed upon the development, processing, and applications of ceramics, plastics, metals, woods, communications, and power. Field trips are required.

217. WOOD TECHNICS. Class 2, Lab. 4, cr. 4. Prerequisite: IED 211.

A basic course involving a study of common hand and portable tools, principles of construction, process planning, finishing procedures, and characteristics and utilization of the common hardwoods and softwoods. Introduction to basic woodworking machines. Field trips are required.

220. CONTEMPORARY AMERICAN INDUSTRY. Class 3, cr. 3.

A study of contemporary American industry with emphasis upon its interpretation in industrial arts. Field trips are required.

225. GRAPHICS OF COMMUNICATION. Class 1, Lab. 4, cr. 3.

A study of the graphic arts principles involved in the selection of typography, process, paper, and format. Introduction to the reproduction processes of relief, lithography, gravure, and screen process printing. Field trips are required.

242. ELECTRICAL FUNDAMENTALS FOR TEACHERS. Class 2, Lab. 4, cr. 4. Prerequisites: IED 211, MA 154.

An introduction to the utilization and control of electrical energy. Content will include the characteristics, functions, and testing of basic circuits and apparatus. The course is organized to present a wide range of contemporary methods for teaching electrical fundamentals. Field trips are required.

245. GENERAL METALS. Class 1, Lab. 6, cr. 4. Prerequisite: IED 211.

The study of common metals and alloys, relating their uses and characteristics to familiar applications of industry. Laboratory experiences will include arc and gas welding, methods of forming and fabricating, finishing techniques, and utiliz-

ing hand tools and basic metal working machines. Field trips are required.

260. PRINCIPLES AND OBJECTIVES OF INDUSTRIAL EDUCATION. Class 3, cr. 3. Prerequisite or corequisite: IED 110.

Historical, legislative, and theoretical foundations of industrial education; objectives of the various types of schools and programs.

262. SUPERVISED WORK EXPERIENCE. Cr. 3, may be repeated to a maximum of 9.

Supervised work experience directed toward providing background and orientation rather than depth in a particular specialty. Craft, technical, industrial, and participation in the conduct of industrial training programs are typical examples of acceptable experiences. Consent of department required.

UNDERGRADUATE LEVEL

Upper-Division Courses

310. MANAGEMENT OF INDUSTRIAL ARTS LABORATORIES. Class 3, cr. 3.

Principles and systems of organization and management; selecting, purchasing, arranging, and maintaining tools, equipment, and supplies in industrial arts laboratories and auxiliary rooms.

326. INTRODUCTION TO POWER. Class 3, Lab. 2, cr. 4.

An introduction to the development, transmission, and utilization of power.

344. GRAPHIC ARTS FUNDAMENTALS. Class 2, Lab. 4, cr. 4. Prerequisite: IED 211.

A study of the printing processes and related areas. An introduction to graphic design, composition, plate-making, presswork, papers and inks, bindery, and finishing operations. Printing by relief intaglio, planography, and stencil methods. Considerations in purchasing supplies and equipment for the school laboratory. Field trips are required.

362. COOPERATIVE OCCUPATIONAL INTERNSHIP. Cr. 3-6, may be repeated to a maximum of 36.

Organized and supervised experience directed toward occupational competence in a specific skilled or technical occupation or staff position as required for vocational teacher certification, applied technology teaching, or industrial supervisory and personnel positions. Planned and supervised by department staff in cooperation with business, industry, labor, government, and other employing organizations and agencies. Consent of department required.

375. TEACHING METHODS IN OCCUPATIONAL EDUCATION. Class 3, cr. 3.

Development of competencies in the use and appraisal of the basic methods of teaching occupational subjects. Appropriateness, advantages, and limitations of specific methods.

411. INDUSTRIAL DESIGN. Class 1, Lab. 4, cr. 3. Prerequisite: consent of instructor.

Processes and methods of design with some emphasis on the designer's role in industry. Industrial products critically evaluated in terms of function, structure material, aesthetic quality, produceability, serviceability, and appropriateness. Laboratory activities include design experiences in various media, i.e., woods, metals, synthetics, ceramics, intended to develop a systematic approach to design problems. Field trips are required.

424. ADVANCED GRAPHIC ARTS. Class 1, Lab. 4, cr. 3. Prerequisite: IED 344.

A study of photo-offset lithography and related photo-mechanical techniques. Fundamentals of copy preparation, photography, process camera work, stripping, platemaking, and presswork. Field trips are required.

427. ADVANCED WOOD TECHNICS. Class 1, Lab. 4, cr. 3. Prerequisite: IED 217.

A study of the scope and work of wood processing machine tools and their adaptation and utilization in the production of wood products.

Emphasis on product development, product engineering, and product manufacturing including process planning, quality control, jig and fixture design, and problems related to wood as a production material. Safety and maintenance of wood machine tools. Field trips are required.

444. OCCUPATIONAL ANALYSIS FOR CURRICULUM PLANNING. Class 3, cr. 3. Prerequisite: permission of instructor.

Study and application of the principles and techniques of analyzing a trade or occupation. Special emphasis is given to the identification of teachable content for the development of vocational-technical curricula and courses.

447. FINISHING INDUSTRIAL MATERIALS. Class 1, Lab. 4, cr. 3. Prerequisite: IED 217.

A study of the types, characteristics, and properties of finishing materials and surface treatments used on various industrial materials such as metals, wood, plastics, ceramics, glass, textiles, and paper. Oppor-

tunities to apply and experiment with a variety of materials and surface treatments on specimens. Safety and maintenance of equipment. Field trips are required.

462. APPRAISAL OF OCCUPATIONAL EXPERIENCE AND COMPETENCY. Cr. 0-36 departmental credit.

Industrial, trade, technical or other occupational experience will be evaluated and a maximum of 36 semester hours credit may be granted. Full credit will be considered only for those candidates who have a minimum of three years appropriate occupational experience and who meet the minimum occupational requirement for vocational certification as established by the Indiana State Plan for Vocational Education. Areas of weakness may be strengthened through enrollment in laboratory courses and/or in IED 362 as required by the adviser.

467. SCHOOL SHOP MANAGEMENT. Class 3, cr. 3.

The school shop and drawing room, including equipment and management. Layout, selection, and arrangement of equipment and supplies; methods of organization and management.

481. COMPREHENSIVE GENERAL SHOP. Class 1, Lab. 4, cr. 3. Prerequisite: consent of instructor.

This course is an integral part of the professional semester for industrial arts teacher education students. It provides laboratory experiences in the study of industrial plastics and industrial ceramics processes, with emphasis on methods of teaching in a comprehensive general shop. Field trips are required.

DUAL LEVEL
Undergraduate-Graduate

510. COURSE DEVELOPMENT IN INDUSTRIAL AND OCCUPATIONAL EDUCATION. Cr. 3. Must be preceded by ED 285 and IED 375, or consent of instructor.

Principles of, and practice in, planning, organizing, and developing instructional content for industrial and occupational education courses.

560. CURRICULUM DEVELOPMENT IN INDUSTRIAL EDUCATION. Cr. 2 or 3. Prerequisite: senior standing or consent of instructor.

Study of current industrial education curriculum designs, problems, and trends; methods of gathering curriculum information; procedures in revising and evaluating a curriculum.

564. TESTS AND MEASUREMENTS IN INDUSTRIAL EDUCATION. Class 2, Lab. 2, cr. 3.

Concepts involved in testing and measuring, with applications in industry and industrial education.

566. EDUCATIONAL AND INDUSTRIAL COORDINATION. Class 3, cr. 3. Prerequisite: senior standing or consent of instructor.

Common problems of education and industry, with emphasis on the development and maintenance of close correlation between school programs of industrial vocational education and the manpower needs of industrial organizations.

568. DEVELOPMENT OF INSTRUCTIONAL MATERIALS FOR INDUSTRIAL AND OCCUPATIONAL EDUCATION. Cr. 3.

Principles of, and practices in, developing supplemental instructional materials and aids for courses in industrial and occupational education.

570. TECHNICAL EDUCATION IN AMERICA. Class 3, cr. 3.

Technical education in the American economic and political system, including its role and purpose, history, administrative and organizational patterns, student characteristics, problems, potentialities.

571. HISTORY AND PHILOSOPHY OF INDUSTRIAL EDUCATION. Class 3, cr. 3.

A study of the leaders, agencies, and movements that have contributed to the development of industrial education with special attention to the economic, social, and philosophical factors that have motivated and influenced this development in America.

572. CONTEMPORARY PROBLEMS IN INDUSTRIAL AND OCCUPATIONAL EDUCATION. Cr. 3.

Analysis and implications of current problems in industrial and occupational education at the secondary, post-secondary, and adult levels. Immediate and long range effects along with solutions and alternatives will be considered.

576. COOPERATIVE EDUCATION PROGRAMS. Class 3, cr. 3. Prerequisite: senior standing or consent of instructor.

History and development of cooperative education, underlying principles and theories, operating practices and programs, administrative and legal aspects.

531. WORKSHOP FOR INDUSTRIAL EDUCATION TEACHERS. Cr. 0-8.

Advanced study of industrial education subjects. Emphasis on new technical

developments, teaching materials, and methods, and laboratory problems, and their application in teaching situations.

588. TECHNICAL PROBLEMS IN INDUSTRIAL EDUCATION. Cr. 1-6. Prerequisite: consent of instructor.

Supervised individual problem work in a technical subject matter area.

590. INDIVIDUAL RESEARCH PROBLEMS. Cr. 1-6. Prerequisite: consent of department.

Opportunity for students to study particular problems in any phase of industrial education or to initiate themselves into research techniques under the guidance of a member of the staff. Does not include thesis work.

GRADUATE LEVEL

621. SEMINAR IN INDUSTRIAL ARTS TEACHING. Class 3, cr. 3.

623. CONTEMPORARY INDUSTRIAL ARTS PROGRAMS. Class 3, cr. 3.

637. ORGANIZATION AND ADMINISTRATION OF VOCATIONAL EDUCATION. Cr. 1-4. Prerequisite: 12 hours in education or equivalent professional training.

646. ANALYSIS OF RESEARCH IN INDUSTRIAL EDUCATION. Class 3, cr. 3. Prerequisite: PSY 500.

647. LEGAL BASES OF VOCATIONAL-TECHNICAL EDUCATION. Class 3, cr. 3.

666. SUPERVISION OF INDUSTRIAL EDUCATION. Cr. 3.

668. SEMINAR IN VOCATIONAL TRADE AND INDUSTRIAL EDUCATION. Cr. 2-4.

696. DESIGN OF RESEARCH IN INDUSTRIAL EDUCATION. Class 3, cr. 3. Prerequisite: PSY 600 and IED 646.

698. RESEARCH. M.S. Thesis.

INDUSTRIAL ENGINEERING TECHNOLOGY (IET)

W. E. Thomas, in charge of curriculum and Head of the Department of Manufacturing Technology

Professor Emeritus: (Fort Wayne) D. G. Wilson, M.S.I.E.

Associate Professors: (Fort Wayne) C. B. Snyder, M.S.I.E.; (IUPUI) M. S. Bowman, M.B.A.; (North Central) J. R. Blackwell, M.B.A.; R. M. Bobillo, M.B.A.

Assistant Professors: (Calumet) J. E. Deuel, M.S.E.; C. D. Rose, M.B.A.

UNDERGRADUATE LEVEL
Lower-Division Courses

104. INDUSTRIAL ORGANIZATION. Class 3, cr. 3. (Not open to students who have completed IET 105 and/or 106.)

A detailed survey of organizational structures, operational, financial, marketing, and accounting activities; duties of management, planning, control, personnel, safety, wages, policy, and human factors necessary for effective management.

105. INDUSTRIAL ORGANIZATION AND PRODUCTION—PART I. Class 2, cr. 2. (Not open to students who have completed IET 104.)

A survey of the growth and fundamental concepts of American industry which includes a study of internal organization, managerial controls, risk and forecasting, financing, research, productive development, production planning, plant facilities, and production and material control. Knowledge of these factors is necessary for the effective management of an enterprise.

106. INDUSTRIAL ORGANIZATION AND PRODUCTION—PART II. Class 2, cr. 2. (Not open to students who have completed IET 104.)

A survey of the fundamental concepts connected with quality control, plant engineering, methods improvement, industrial relations, personnel, management, training, motivation, wages, marketing, advertising and sales. Knowledge of these factors is necessary for the effective management of an enterprise.

120. SYSTEMS AND PROCEDURES. Class 3, cr. 3.

An introduction to the systems concept. Surveys recognizing and defining the system's problem; the management audit and tools for systems analysis; design and control of forms, work simplification, work measurement and procedures; operations research; punched card systems; management and administration; and organization of the systems function.

198. INDUSTRIAL PRACTICE I. Cr. 1.

Practice in industry and written reports of this practice for co-op students.

204. TECHNIQUES OF MAINTAINING QUALITY. Class 2, Lab. 3, cr. 3. Prerequisites: MA 111 and 112, or 150.

An analysis of the basic principles of quality control. Includes statistical aspects of tolerances, basic concept of probabilities, frequency distribution, X and R charts and uses of mechanical, electronic, air and light devices for checking and measuring to determine quality levels of acceptance.

220. CRITICAL PATH ANALYSIS. Class 1, Lab. 3, cr. 2.

Detailed study of planning and control of a schedule by network techniques, including the time/cost analysis of CPM scheduling for application on construction projects, job shop scheduling and related problems. Includes an introduction to PERT and the use of the computer for network analysis.

224. PRODUCTION PLANNING AND CONTROL. Class 2, Lab. 3, cr. 3.

Preproduction planning of the most economical methods, machines, operations, and materials for the manufacture of a product. The planning, scheduling, routing, and detailed procedure of production control.

244. FUNDAMENTALS OF PRODUCTION COST. Class 1, Lab. 3, cr. 2.

Fundamental mechanics (rules for debit and credit) of accounting, principles of account classification, business forms and procedures, financial and operating statements, and elements of cost accounting—all from the viewpoint of industrial organization.

250. FUNDAMENTALS OF PRODUCTION COST ANALYSIS. Class 2, Lab. 2, cr. 3. Prerequisite or corequisite: IET 104.

Surveys of fundamental mechanics of accounting, principles of account classification, financial and operating statements, and the generation of cost data according to cost accounting principles. Surveys the generation of cost data according to the principles of engineering economy. Examines applications of cost accounting data and engineering economy cost data to specific management decision areas through selected case problems.

262. MOTION STUDY AND WORK METHODS. Class 2, Lab. 3, cr. 3.

The study of the various techniques of motion study including process charts, operation charts, multiple activity charts, micro and memo motion study, therbligs, the movie camera, along with actual practice in their use. Includes study and application of the basic principles used to develop better methods of performing work.

266. WORK MEASUREMENT AND INCENTIVES. Class 2, Lab. 3, cr. 3. Prerequisite: IET 262.

A study of the fundamentals of time study and work measurement with actual practice in their use. Includes stop watch time study, measuring work with movie camera, the establishment of allowances by both stop watch and work sampling studies, the establishment and use of predetermined time values, and the construction and use of work measurement formulae.

268. PLANT LAYOUT. Class 2, Lab. 3, cr. 3. Prerequisite: EG 110, or equivalent.

Arrangement of stock, machine, layout of aisles, and use of space, and material handling for the highest efficiency of production.

272. JOB EVALUATION. Class 2, cr. 2.

A survey of the basic principles and significance of job evaluation. An analysis of current practices and techniques used in job analysis, job descriptions, and job evaluation.

280. WAGE INCENTIVE. Class 2, cr. 2.

An analysis and study of various types of wage incentive plans, their signifi-

cance, adaptibility, effectiveness, and equitability. A systematic appraisal of the basic objectives and currently used techniques in the administration of wage incentive programs.

296. INDUSTRIAL TECHNOLOGY CASE PROBLEMS. Class 2, cr. 2.

Application of theories developed in the several industrial technology courses to selected general case problems—to provide practice in the integration of principles.

298. INDUSTRIAL PRACTICE II. Cr. 1.

Practice in industry and written reports of this practice for co-op students.

299. INDUSTRIAL ENGINEERING TECHNOLOGY. Class 0-4, Lab. 3-9, cr. 1-9. Hours and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

UNDERGRADUATE LEVEL
Upper-Division Courses

301. COST EVALUATION AND CONTROL. Class 3, cr. 3. Prerequisite: IET 250.

Designing, installing, and improving standard cost systems in industry, including the establishment of basic standards. Develops the mechanics of operating control reports utilizing principles of management by exception. The use of cost systems for estimating, scheduling, facilities planning, and making economic evaluations. The use of electronic data processing for establishing and analyzing production cost standards will be emphasized.

312. MATERIALS HANDLING. Class 3, cr. 3. Prerequisite: IET 104.

A survey of materials handling elements, the unit load, packaging, bulk handling, the economics of materials handling, improving existing handling methods, justification for handling equipment, special handling techniques, and the management of the materials handling divisions in the industrial organization.

323. PRODUCTION PLANNING AND EXPEDITING. Class 2, Lab. 3, cr. 3.

Methods of planning for routing, tooling, equipment, costing and production of manufactured and processed products. Includes a detailed study of expediting procedures.

324. PRODUCTION TECHNIQUES. Class 3, cr. 3. Prerequisite: IET 224.

Continuation of operation planning with emphasis upon the equipment, tools, and techniques used in mass production. Adaptation of proposed plans to conform to existing facilities.

351. PRODUCTION CONTROL TECHNIQUES. Class 3, cr. 3. Prerequisites: IET 224 and 301.

The study of the various established techniques for analyzing and improving production operations. Emphasis is placed on the application of established analysis techniques such as critical-path scheduling, PERT inventory control, inventory management, forecasting, and linear programming. The use of computer programs for solving problems will be emphasized.

354. ATTRIBUTE AND VARIABLE SAMPLING. Class 2, cr. 2. Prerequisite: IET 204.

Survey single, double, sequential, variable, and continuous production sampling plans. It includes the calculation and plotting of OG, AOQ, and AOQL curves and determining the economic sampling number. Also includes the use of Dodge Romig, MIL STD 105 and MIL STD 414 tables.

364. TOTAL QUALITY CONTROL. Class 3, cr. 3.

The course is aimed at determining customer needs and wants, interpreting these into a design during production, follow-up on field performance, and feeding back quality information to further improve the quality system.

398. INDUSTRIAL PRACTICE III. Cr. 1.

Practice in industry and written reports of this practice for co-op students.

404. INDUSTRIAL ORGANIZATION. Class 3, cr. 3. (Not open to students who have had IET 104).

A study of industrial organization structures and an introduction to managerial responsibilities including the activities of industrial administration, financing, managerial controls, product development, manufacturing engineering, material control, quality control, and manpower management areas of operations.

450. PRODUCTION COST ANALYSIS. Class 2, Lab. 2, cr. 3. (Not open to students who have had IET 250).

An introduction to financial statements and to the study of the costs of production in terms of break-even and least cost alternatives including present and future costs when related to the time value of money, budgeting, labor and

overhead, production cost control and the role of the supervisor and the industrial engineering technologist to cost control.

460. MOTION AND TIME STUDY. Class 2, Lab. 3, cr. 3. Prerequisite: junior standing.

Techniques of motion and time study, process charts, operation charts, multiple activity charts, micromotion study, therbligs, and stop-watch time study.

497. SENIOR PROJECT. Class 2, Lab. 2, cr. 3.

Hours to be arranged. Directed work on individual projects for senior industrial engineering technology students.

498. INDUSTRIAL PRACTICE IV. Cr. 1.

Practice in industry and written reports of this practice for co-op students.

INDUSTRIAL SUPERVISION (IS)

T. F. Hull, Head of the Department

Professors: (IUPUI) H. L. Wisner, M.S.; (West Lafayette) T. F. Hull, Ed.D.

Professor Emeritus: (West Lafayette) L. F. Greenberger, Ph.D.

Associate Professors: (Fort Wayne) C. H. Creasser, LL.B.; R. E. Hill, Ph.D.; (IUPUI) O. A. Paul, M.B.A.; (West Lafayette) G. D. Barnes, M.B.A.; C. D. Fuller, M.S.; J. L. Windle, Ph.D.

Assistant Professors: (Calumet) B. A. Hindmarch, M.B.A.; D. E. Norris, B.S.Ed.; (Fort Wayne) G. W. Abbott, M.A.; (IUPUI) D. W. Ebling, M.B.A.; G. A. Weed, B.S.; (West Lafayette) R. D. Cupka, M.S.; J. W. Holcroft, M.S.; M. H. Steel, M.A.; J. W. Walker, M.S.Ed.

UNDERGRADUATE LEVEL
Lower-Division Courses

100. INDUSTRIAL SUPERVISION LECTURES. Class 1, cr. 1.

Introduction to the Department of Industrial Supervision and to the curricula available in it, and an overview of the supervision and personnel functions in business, industry, and government.

240. LABOR RELATIONS PROBLEMS. Class 3, cr. 3.

Problems of workers with possible solutions as suggested by organized labor and management. Regulations concerning management, labor, the collective bargaining agreement, grievance and arbitration procedures.

252. HUMAN RELATIONS IN INDUSTRY. Class 3, cr. 3.

Study of the bases of human relations and the organization of individual and group behavior. Special emphasis on typical industrial and business relationships in everyday situations. Examines fundamental relationships between behavior and personal and group forces.

262. SUPERVISED WORK EXPERIENCE. Cr. 1-3. Consent of department required. May be repeated to a maximum of nine.

Supervised work experience directed toward providing orientation, background, and insight into industrial operations. Technical and industrial jobs or participation in industrial training programs are typical examples of acceptable experiences. Consent of department required.

268. ELEMENTS OF LAW. Class 3, cr. 3.

An introductory law course with a brief comparison of the American federal system and the parliamentary system of government, and covering law with emphasis on judicial review, and court jurisdiction and procedure generally and basic law in particular.

UNDERGRADUATE LEVEL
Upper-Division Courses

331. OCCUPATIONAL SAFETY AND HEALTH. Class 3, cr. 3. Prerequisite: consent of instructor.

A study of the industrial accident problem and its control. Accident analysis through the modern accident prevention philosophy of causation control. Accident

prevention training; organization for accident prevention; workmen's compensation laws.

362. COOPERATIVE OCCUPATIONAL INTERNSHIP. Cr. 3-6. May be repeated to a maximum of 24.

Organized and supervised work experience directed toward preparation for supervisory, personnel, and related positions in industry. Planned and supervised by departmental staff in cooperation with business, industrial, labor, government, and other employing organizations and agencies. Consent of department required.

368. LEGISLATION AFFECTING INDUSTRIAL RELATIONS. Class 3, cr. 3.

Wage contracts and payments, workmen's compensation and insurance, injunction, strikes and boycotts, and statutes affecting labor.

374. INDUSTRIAL SUPERVISION. Class 3, cr. 3.

Introduction to and overview of the function of supervision in business, industry, and government. Emphasis on the importance, practices, and characteristics of the supervisor.

375. BASIC METHODS OF INDUSTRIAL TRAINING. Class 3, cr. 3.

Principles, practices, and variations of basic methods of instruction as related to training situations in business and industry.

376. PERSONNEL PROBLEMS IN INDUSTRY. Class 3, cr. 3. Prerequisite: IS 374 or consent of instructor.

Analysis of selected case problems, with emphasis on attitudes, philosophies, and responsibilities of supervisory personnel in relationship to the worker.

474. CONFERENCE LEADERSHIP TRAINING. Class 2, Lab. 2, cr. 3.

Understanding of the role of the conference in business and industry together with practical applications of the various techniques of conference leadership and an understanding of group dynamics in the conference situation.

DUAL LEVEL
Undergraduate-Graduate

574. MANAGERIAL TRAINING AND DEVELOPMENT. Class 3, cr. 3. Prerequisite: IS 374 or consent of instructor.

Review of current managerial education and development theories and practices; discussion of fundamental social, economic, and political changes affecting business and the work of managing; implications of these changes for individual manager development and continued growth.

577. ORGANIZATION AND ADMINISTRATION OF INDUSTRIAL TRAINING. Class 3, cr. 3. Prerequisite: IS 574.

Organization of the training function; the relationship of the training department to other departments of the plant; the evaluation of training; administrative practices; the selection and education of training personnel; professional and nonprofessional activities of training personnel.

590. INDUSTRIAL RESEARCH PROBLEMS. Cr. 1-6. Prerequisite: consent of department.

Opportunity for students to study specific problems in any phase of industrial supervision or to initiate themselves into research techniques and methods under the guidance of a qualified faculty member within the department. Does not include thesis work.

GRADUATE LEVEL

667. SUPERVISED FIELD PRACTICE IN INDUSTRIAL TRAINING. Cr. 3.

MECHANICAL ENGINEERING TECHNOLOGY (MET)

W. E. Thomas, in charge of curriculum and Head of the Department of Manufacturing Technology

Professors: (Calumet) C. E. Columbus, M.S.M.E.; (Fort Wayne) W. W. Worthley, D.Engr.; (West Lafayette) W. E. Thomas, M.S.I.E.

Associate Professors: (Calumet) E. C. Gallett, M.S.M.E.; (Fort Wayne) H. F. Gerdom, M.S.; D. J. McAleece, M.S.; C. J. Quinn, M.A.; (IUPUI) S. Close, B.M.E.; R. M.

Frank, M.S.; R. E. Peale, M.S.I.E.; H. W. Stoelk; J. M. Ulrich, M.S.M.E.; (Indiana University-Eastern at Richmond) W. M. Barker, M.A.; (North Central) F. R. Lisarelli, M.A.; (West Lafayette) H. L. Banton, M.S.M.E.; W. F. Harrison, M.A.; G. F. Hartje, M.S.; V. L. Hastings, M.S.I.E.; W. F. Melhorn, M.S.Met.E.; R. L. Miller, M.S.I.E.; H. A. Montgomery, M.S.I.E.; S. L. Pritchett, M.S.; H. R. Roach, M.S.C.E.

Assistant Professors: (Calumet) J. E. Anderson, M.S.; G. E. DeGraff, M.S.; R. F. McCormick, M.S.; P. Perkins, B.S.M.E.; (Fort Wayne) L. R. Allendorph, M.S.; B. Kemp, M.S.; E. E. Messal, Ph.D.; J. F. Rosencrans, B.S.; D. J. Schmidt, M.S.; J. E. Tryon, B.S.; (IUPUI) W. L. Buehler, M.S.M.E.; M. W. Milgate, M.S.; R. E. Moll, M.S.; R. E. Tharp, M.S.; (Indiana University-Southeastern at Jeffersonville) H. D. Brettschneider, M.S.Met.E.; G. T. Popp, M.C.E.; (Indiana University-Eastern at Richmond) L. J. Ike, M.S.E.; (West Lafayette) W. L. Baldwin, M.S.M.E.; B. E. Nuckols, M.S.; J. D. Pounds, M.S.C.E.; H. T. Travis, M.S.I.E.

Instructor: (Calumet) J. M. Peterson, M.S.

Lecturer: (Fort Wayne) R. E. Carlson, B.S.

UNDERGRADUATE LEVEL

Lower-Division Courses

100. APPLIED ENGINEERING COMPUTATIONS. Lab. 3, cr. 1.

Practical application of the proper use of the slide rule, desk calculator, and an introduction to the electronic computer and dimensional analysis. How to draw graphs and introduction to means of their reproduction.

112. APPLIED MECHANISMS. Class 3, cr. 3.

An analysis of motions, displacements, velocities, friction wheels, instant centers, flexible connectors, cams, linkages, and gears.

140. CASTING PROCESSES. Class 1, Lab. 6, cr. 3.

A survey of basic casting processes with emphasis placed on understanding the component parts of a foundry operation. Areas covered are patterns, cores, cleaning, melting, molding, and pouring. Laboratory exercises will augment the lecture discussions.

145. FOUNDRY SANDS. Class 1, Lab. 3, cr. 2.

An introduction to the testing procedures used in the study and control of foundry sands; also the analysis of casting defects attributed to sand.

156. GRAPHIC COMPUTATIONS. Lab. 6, cr. 3. Prerequisite: EG 110; prerequisite or corequisite: MA 112.

Descriptive geometry principles applied to the solution of engineering problems; intersections and development of surfaces; layout of objects in space; and determination of clearances between objects in space.

180. MATERIALS AND PROCESSES. Class 2, cr. 2.

Application and characteristics, both physical and chemical, of the materials most commonly used in industry; the primary processes involved in producing these materials for industry.

198. INDUSTRIAL PRACTICE I. Cr. 1.

Practice in industry and written reports of this practice for co-op sudents.

200. POWER SYSTEMS. Class 3, cr. 3. Prerequisite: MA 221.

A survey of steam and nuclear power plants, internal combustion engines, gas turbines, pumps, compressors, fans and blowers, refrigeration. Some theory in thermodynamics, combustion of fuels, heat transfer. Power generation and application to various fields with special mention of transportation

204. PRODUCTION DRAWING. Class 0, Lab. 6, cr. 3. Prerequisites: EG 110 and MET 180.

Application of principles of engineering drawing to detail, assembly, design layout, equipment installation, and related drawings.

210. APPLIED STATICS. Class 2, cr. 2. Prerequisite or corequisite: MA 150.

Force systems, resultants and equilibrium, centroids of areas and centers of gravity of bodies, trusses, frames, beams, friction and moments of inertia of areas and bodies.

211. APPLIED STRENGTH OF MATERIALS. Class 4, cr. 4, or Class 3, Lab. 2, cr. 4. Prerequisite or corequisite: MA 221.

Principles of applied strength of materials primarily with reference to mechanical design.

212. MECHANICS OF MATERIALS. Class 4, cr. 4 or Class 3, Lab. 2, cr. 4. Prerequisites or corequisites: MA 112 and GNT 136.

Forces acting on rigid bodies at rest and in motion: embracing vectors, force laws and moment laws of equilibrium for various force systems, centroids, center of gravity and moments of inertia, stress and strain, riveted and welded joints, torsion, shear, bending and deflection of beams, combined stresses and columns.

215. WELDING. Class 1, Lab. 4, cr. 3.

The study of welding equipment and processes. Laboratory practice in typical welding problems using both arc and gas methods.

216. MACHINE ELEMENTS. Class 4, cr. 4, or Class 3, Lab. 2, cr. 4. Prerequisites: MET 204, 211, and 212.

A survey of the more important elements used in tools and machines, and their general characteristics pertaining to application, operational behavior, efficiency, economy, and standardization.

228. MACHINE DESIGN. Lab. 6, cr. 3. Prerequisite or corequisite: MET 216.

Practical applications in the design of machines and products utilizing mechanical, pneumatic, hydraulic and electrical operation and control.

232. DYNAMICS. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisites: MET 211 and MA 222.

Basic fundamentals of dynamics; displacement, velocities, accelerations, work energy, power, impulse, momentum, and impact.

236. JIG AND FIXTURE DESIGN. Lab. 6, cr. 3. Prerequisite: MET 204.

Application of principles in the design and construction of drilling, milling, reaming and assembly jigs and fixtures; information related to materials, heat treatment and cost estimating. Gaging characteristics, selection, and design for interchangeable manufacturer.

240. MELTING UNITS, OPERATION AND DESIGN. Class 1, Lab. 3, cr. 2.

A study in the design and use of typical melting units used in connection with cast metals.

249. FOUNDRY PROBLEMS. Class 1, Lab. 6, cr. 3.

A study of typical foundry problems dealing with the areas of sands, melting, cleaning, cores, pouring, molding, and solution of casting defects.

256. MATERIALS FABRICATION. Class 2, cr. 2. Prerequisite: MET 180.

A study of the physical characteristics of metals and nonmetals with respect to their behavior during fabrication; methods of material removal; elementary aspects of machine tool operation and tooling requirements.

288. DIE DESIGN. Lab. 6, cr. 3. Prerequisite: MET 204.

Application of principles in the design and construction of piercing, blanking, forming, drawing dies; single combination compound and progressive type dies. Cam and assembly dies. Related information as to materials, heat treatment, and cost estimating.

298. INDUSTRIAL PRACTICE II. Cr. 1.

Practice in industry and written reports of this practice for co-op students.

299. MECHANICAL ENGINEERING TECHNOLOGY. Class 0-4, Lab. 3-9, cr. 1-9.

Hours and subject matter to be arranged by staff. Primarily for third- or fourth-semester students with special aptitudes. Course may be repeated for credit up to nine hours.

UNDERGRADUATE LEVEL
Upper-Division Courses

300. APPLIED THERMODYNAMICS. Class 3, cr. 3. Prerequisites: MA 222 and MET 200.

The fundamentals of thermodynamics including application of the first and second laws, enthalpy, entropy, reversible and irreversible processes.

330. INTRODUCTION TO FLUID POWER. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3.

A study of the development, transmission, and utilization of power through fluid power circuits and controls.

332. FLUID POWER CIRCUITS. Class 2, Lab. 2, cr. 3. Prerequisite: MET 330.

Principles and practices for selecting and applying fluid power devices and related equipment to machine circuits for both linear and rotary motion. The nature of the work to be accomplished and the various fields of application will be analyzed.

335. BASIC MACHINING. Class 1, Lab. 3, cr. 2. Prerequisites: MET 180, EG 110, or equivalents.

A comprehensive survey of machine tools as they are used in converting work-pieces into finished products with consideration of cost, quality, quantity, and interchangeability. Actual operation analysis of many machine tool setups will be provided for comparison studies.

340. PIPING AND PLUMBING DESIGN. Class 3, cr. 3. Prerequisite: MET 330.

Design of plumbing systems, includes losses in pipes, fittings, nozzles, orifices, etc. Includes steam, water, and oil systems. Piping handbooks and catalogs are utilized in conjunction with the State of Indiana Piping Code.

350. APPLIED FLUID MECHANICS. Class 3, cr. 3. Prerequisite: MET 300.

The fundamentals of fluid mechanics, including properties of fluid, pressure; hydrostatic force on submerged areas; kinematics and dynamics of fluid flow; friction losses and sizing of pipes.

355. PRODUCTION MACHINING. Class 2, Lab. 3, cr. 3. Prerequisite: MET 335.

An intensive study of production processes, tools, setups, workpiece materials machinability, newer methods of machining, and the economics of efficient materials machining.

360. HEATING, VENTILATING, AND AIR CONDITIONING. Class 3, cr. 3 or Class 2. Lab. 2, cr. 3. Prerequisite: MET 200.

A study of heat losses, heat producing equipment, and cooling equipment in addition to the design of the direct systems. Includes controls and cost estimating for commercial, industrial and residential systems. Codes and standards are emphasized throughout the course.

361. REFRIGERATION. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3. Prerequisite: MET 200.

Design and maintenance of refrigeration systems for large and small applications. This course is intended to complement MET 360 for large air conditioning systems.

370. INTRODUCTION TO NUMERICAL CONTROL. Class 2, cr. 2. Prerequisite: MET 335.

An introduction to the numerical control process. The course includes history, economic evaluation, additional benefits, and a discussion of system components. Primarily directed toward the manufacturing process, the course covers various types of N/C equipment.

371. PROGRAMMING FOR NUMERICAL CONTROL. Class 1, Lab. 2, cr. 2. Prerequisite: algebra, trigonometry, MET 265, 335, or permission of instructor.

An introduction to manual and computer aided programming. The course covers manual point to point programming for both incremental and absolute systems and computer aided programming with the emphasis on the APT language.

380. MATERIALS AND PROCESSES. Class 2, cr. 2. Open only to non-MET students.

Application and characteristics, both physical and chemical, of the materials most commonly used in industry; the primary processes involved in producing these materials for industry.

384. INSTRUMENTATION. Class 2, Lab. 3, cr. 3.

Introduction to the basic concepts and terminology of instruments. Procedures and techniques essential to industrial measurement and transmission of data. Emphasis on pressure flow, temperature level, and humidity measurements. Study of hysteresis repeatability, weighted signals, span, suppression and range.

385. FLUID POWER SYSTEMS ANALYSIS. Class 2, Lab. 2, cr. 3. Prerequisites: MET 350 and 330.

Procedures and techniques essential for checking integrated systems; using electrical, mechanical, and fluid power equipment. Functional aspects, safety, efficiency, and the economics of systems combining features for power and control will be analyzed including automatic, semiautomatic and manually operated machines.

398. INDUSTRIAL PRACTICE III. Cr. I.

Practice in industry and written reports of this practice for co-op students.

400. POWER SYSTEMS. Class 3, cr. 3. Prerequisite: GNT 136. Open only to non-MET students.

A survey of steam and nuclear power plants, internal combustion engines, gas turbines, pumps, compressors, fans and blowers, and refrigeration. Some theory in thermodynamics, combustion of fuels, and heat transfer. Power generation and application to various fields with special mention of transportation.

412. MECHANICS OF MATERIALS. Class 4, cr. 4. Prerequisite: GNT 136; prerequisite or corequisite: MA 112. Open only to non-MET students.

Forces acting on rigid bodies at rest and in motion: embracing vectors, force laws and moment laws of equilibrium for various force systems, centroids, center

of gravity and moments of inertia, stress and strain, riveted and welded joints, torsion, shear, bending and deflection of beams, combined stresses and columns.

426. INTERNAL COMBUSTION ENGINES. Class 2, Lab. 2, cr. 3.

A study of the spark ignition, compression ignition and continuous burning internal combustion engines.

485. CONTROL SYSTEMS COMPONENTS. Class 2, Lab. 3, cr. 3. Prerequisites: MET 384, 385, or permission of the instructor.

Principles and practices for selecting and applying computing and controlling components in process control systems. Emphasis on the operating characteristics of pneumatic equipment with studies of process time lag, dead time, and reaction rate together with effect of these upon on-off, proportioned band, reset and rate control modes.

486. CONTROL SYSTEMS ANALYSIS. Class 3, Lab. 0, cr. 3. Prerequisites: MET 384, 385, 485, or permission of the instructor.

Studies of industrial control systems using both the Ziegler-Nichols ultimate sensitivity method of system adjustment and reaction rate method of adjustment. Study of analysis measurements and sampling systems. By use of industrial literature, student is to develop a bill of materials for a control system.

497. SENIOR PROJECT. Class 2, Lab. 2, cr. 3.

Directed work on individual projects for senior mechanical engineering technology students.

498. INDUSTRIAL PRACTICE IV. Cr. 1.

Practice in industry and written reports of this practice for co-op students.

499. MECHANICAL ENGINEERING TECHNOLOGY. Class 0-4, Lab. 3-9, cr. 1-9.

Hours and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

MENTAL HEALTH TECHNOLOGY (MHT)

Denver Sams, in charge of curriculum and Acting Head of the Department of General Studies

Associate Professor: (Fort Wayne) R. W. Hawley, M.S.W.

UNDERGRADUATE LEVEL

Lower-Division Courses

100. INTRODUCTION TO MENTAL HEALTH. Class 3, Lab. 4, cr. 5.

An orientation to mental health. History, current concepts and roles of the various workers in the field are discussed. Field trips and supervised patient work are required.

110. PERSONAL GROWTH AND INTERPERSONAL SKILL. Class 1, Lab. 2, cr. 1.

Personal growth in the areas of therapeutic attitudes and interpersonal skills utilizing techniques of experience-based and learning. Objective observation and recording of behavior and beginning skills in interviewing are developed.

111. PERSONAL GROWTH AND THE HELPING RELATIONSHIP. Class 1, Lab. 2, cr. 2.

Didactic presentation of the dimensions and progression of the helping relationship. Experience-based-learning is utilized to develop effective helping skills. Various schools of therapeutic thought are studied and discussed.

121. WORKSHOP IN INTERPERSONAL RELATIONS. Class 1, cr. 1.

Five-day workshop prior to fall classes in first year. Experience-based-learning techniques are utilized to study the relationships between self-insight, interpersonal effectiveness, and helping persons in distress.

200. ACTIVITY THERAPIES. Class 2, Lab. 6, cr. 5.

Use of ancillary therapies in working with patients. A laboratory to develop introductory skills as in recreational, occupational, and music therapy and a practicum to utilize this training in treatment programs are included.

201. BEHAVIOR MODIFICATION. Class 3, Lab. 4, cr. 5.

Theories, philosophy, principles, and empirical findings of behavior modification. Techniques and skills are developed and applied in the field.

205. PRACTICUM IN MENTAL HEALTH. Cr. 1.
Written reports based on successful completion of clinical experience whereby student works directly with patient in a treatment setting under close professional supervision.

210. HUMAN RELATIONS AND GROUP DYNAMICS. Class 1, Lab. 2, cr. 2.
An introduction to the structure and dynamics of small groups. The students study their own small groups, focusing on group process, the development and maintenance of norms, leadership, conflict and decision-making. Didactic material on group dynamics is presented.

211. THE INDIVIDUAL, SOCIAL SYSTEMS AND THE DYNAMICS OF CHANGE. Class 1, Lab. 2, cr. 2.
Didactic presentations and experience-based learning emphasizing dimensions of planned change both for the individual and social systems. Experience in leading small groups is also provided.

221. ADVANCED WORKSHOP IN INTERPERSONAL RELATIONS. Class 1, cr. 1.
Five-day workshop prior to classes in second year. An in-depth continuation of MHT 121.

251. THE CASE STUDY METHOD. Class 3, Lab. 4, cr. 5.
The historical development, present status, goals and philosophy of psychodynamic case study will be reviewed. The generic problem-solving process of giving service to individuals, groups and communities will be explored through studying case records and professionally supervised practicum in help-giving agencies.

298. SEMINAR IN MENTAL HEALTH. Class 3, cr. 3.
Discussions and explorations of problems in mental health.

METALLURGICAL ENGINEERING TECHNOLOGY (MTT)

W. E. Thomas, in charge of curriculum and Head of the Department of Manufacturing Technology

Professor: (Calumet) A. L. Kaye, Sc.D.

UNDERGRADUATE LEVEL
Lower-Division Courses

184. FERROUS METALLURGY. Class 3, cr. 3.
Fundamentals of production metallurgy with specific consideration of the methods employed in the reduction and refining of iron and steel.

228. PHYSICAL METALLURGY I. Class 3, Lab. 3, cr. 4. Prerequisite: MTT 184 or GNT 176.
Basic principles: solid solutions, intermetallic compounds, equilibrium diagrams, plastic deformation, recrystallization and grain growth, heat treatment, and phase changes in the solid state.

229. PHYSICAL METALLURGY II. Class 3, Lab. 3, cr. 4. Prerequisite: MTT 228.
A continuation of MTT 228.

240. HEAT TRANSFER AND THERMODYNAMICS. Class 2, Lab. 3, cr. 3. Prerequisite or corequisite: MA 222.
Fundamentals of heat transfer as applied to furnaces, heat exchangers, steam generators, and distilling equipment. Also includes fundamental laws of thermodynamics as applied to metallurgy.

280. NONFERROUS METALLURGY. Class 2, cr. 2.
Fundamentals of production metallurgy, with specific consideration of the methods employed in the reduction and refining of selected nonferrous metals.

284. METALLOGRAPHY. Class 1, Lab. 6, cr. 3. Prerequisite: MTT 228.
Preparation and microscopic examinations of metals.

290. MECHANICAL METALLURGY. Class 3, cr. 3, Prerequisite: MTT 228.
Metallurgical aspects of metal processing including welding, forging, stamping, etc., are presented. The newer industrial techniques are investigated in metal processing, powder metallurgy, vacuum and zone refining, etc.

UNDERGRADUATE LEVEL
Upper-Division Courses

390. CERAMICS, POLYMERS, AND COMPOSITES. Class 3, cr. 3. Prerequisites: MTT 228 and 229.
The structure, properties, and manufacture of ceramics, polymers, and composites.

The study of manufacture is limited to the more popular materials in common use.

396. CHEMICAL AND METALLURGICAL TECHNOLOGY. Class 2-4 and/or Lab. 3-9, cr. 1-7. Fee will be charged at the rate of $15 per class hour and $4 per laboratory hour. Hours as arranged with staff.

Primarily for students who have completed the requirements for the diploma in applied technology. Special studies in chemical and metallurgical technology.

491. APPLIED METALLURGY. Class 3, cr. 3.

A study of ferrous and nonferrous metals and alloys. Includes atomic structure, bonding, and arrangements of atoms; phase diagrams; reactions within solid materials; and the interrelation of these to show how structure determines the properties of a material.

NURSING (NT)

Helen R. Johnson, Head of the Department

Professors: (Calumet) Esther F. Ramsey, M.S.; (West Lafayette) Helen R. Johnson, M.S.

Associate Professors: (Calumet) Joyce Ellis, M.S.; Gwendolyn W. Engle, M.S.; Gloria J. Smokvina, M.S.; Judith K. Stryczek, M.S.; (Fort Wayne) Marjorie E. Crill, M.S.; Doris O. Mack, M.A.; Jane K. Niles, M.S.; (North Central) Bernice A. Schaapveld, M.S.; (West Lafayette) Vartanoosh Ayrandjian, M.A.; Ida W. Casey, M.S.; Dixie G. Emler, M.S.; G. Ann Larowe, M.S.; Mary Jo Mirlenbrink, M.S.; Eoto R. Stokes, M.S.

Assistant Professors: (Calumet) Louise G. Buechley, M.N.; Esther E. Droege, M.S.; Laurie Orlich, M.S.; Margaret E. Prugh, A.B., G.N.; Dorothy L. Sabolsice, M.S.; Dorothy J. Slamkowski, M.S.; (Fort Wayne) Elaine N. Cowen, M.S.; Phyllis E. Eckman, M.S.; Betty L. Funck, M.S.; (North Central) Marilyn J. Bourgeois, M.S.; Iva P. Brunner, M.A.; Geraldine E. Chamberlin, M.S.; (West Lafayette) Mary A. Anderson, M.S.; Mary E. Blatchley, M.S.; Mary C. Farley, M.S.; Joanne G. Guendling, M.S.; Jo A. Haynes, M.P.H.; Peggy M. Herzog, M.S.; Mary T. Roy, M.S.N.

Instructors: (Calumet) Beverly R. Bailey, B.S.; Rhoda M. Givens, B.S.; Joyce H. Godels, M.S.; Carol J. Magliola, B.S.; Janet M. Mayorga, B.S.; Susan E. Rehrer, B.S.N.; Mary A. Thomas, B.S.N.; (Fort Wayne) Dorothy D. Burrows, B.S.N.; Patricia A. Erdman, B.S.N.; Carol E. Goddard, B.S.N.; Martha G. Halstead, B.S.; Barbara A. Hill, B.S.N.; Robin K. Rogers, B.S.; (North Central) Aline L. Baughman, B.S.; Patricia A. Dunham, B.S.N.; Dianne Schlake, B.S.; Marion V. Whitlow, B.S.N.; Paula J. Wringer, B.S.; (West Lafayette) Shirley W. Belleville, B.S.N.; Marilyn A. Caster, B.S.; Doris L. Colenbrander, B.S.N.; Judy J. Corfman, B.S.; Gail L. Dahlke, B.S.; Judith R. Dieterle, B.S.N.; Nancy J. Dilling, B.S.; Beverly G. Ferguson, B.S.N.; Nancy M. Fruin, B.A.; Dona M. Gambrel, B.S.; Sharon M. Gray, B.S.; Garnet F. King, B.S.; Elizabeth L. Martin, B.S.; Geri L. McCallig, B.S.N.; Shirley S. Rusk, B.S.; Louella F. Shade, B.S.; Iris K. Tibbetts, M.A.; Bruna A. Zorzes, M.S.

PERSONAL SERVICE COURSES*

Students successfully completing personal service courses numbered 1-99 earn certificate units and not University credit.

4. COMMUNITY HEALTH. Class 1, cert. unit 1.

Basic study of the role of the practical nurse in community health. Emphasis on mental health concepts and community facilities for persons with mental health problems.

Basic survey of general community health facilities as they relate to the role of the practical nurse as a provider of health services in the maintenance of optimum community health.

8. PERSONAL AND VOCATIONAL RELATIONSHIPS. Class 2, cert. units 2.

Designed to assist the student in adjustment to the role of the nurse in the hospital and in the community. Emphasis is

* The cost for transportation to and from hospitals and field trips will be paid by the individual student directly to the carrier.

placed on interaction with patients and personnel. Nursing organization, legal implications in nursing and concepts of professional ethics are presented and discussed.

12. ANATOMY AND PHYSIOLOGY. Class 4, cert. units 4.

Basic study of human anatomy and physiology functions with limited references to biology, chemistry, and basic science. Lectures also include an introduction to deviations from normal body functions.

16. FAMILY LIVING. Class 2, cert. units 2.

Deals with general principles of growth and developmental stages from infancy to old age, together with the social structures operative. Includes fundamentals of contemporary family structure, roles, activities, and health needs as a unit within the community.

20. NUTRITION AND DIET THERAPY. Class 3, Lab. 1, cert. units 4.

Introduction to basic nutrition and nutritional principles involved in maintaining optimum health. Develops an understanding of normal and therapeutic diets in all phases of life cycles with special emphasis on the role of the practical nurse in assisting the patient and his family in understanding and accepting individualized requirements. Practice in planning, preparing, and serving of diets included.

24. FUNDAMENTALS OF NURSING. Class 5, Lab. 8, cert. units 8.

Develop skills necessary to give nursing care to the subacute, convalescent and chronically ill patient, together with an understanding of the basic principles involved. Demonstration and practice of nursing skills form a major portion of this course.

44. MEDICAL NURSING. Class 6, Lab. 28, cert. units 11. (Eight weeks)

Practical application of acquired preclinical nursing skill with observation of application of concepts of nutrition, social interaction, mental health concepts, and deviations of normal body processes operative in the medical patient.

56. SURGICAL NURSING. Class 7, Lab. 28, cert. units 12. (Eight weeks)

Practical application of acquired preclinical nursing skills with observations and understandings of nutritional concepts, and deviations of normal body processes operative in the surgical patient.

64. MATERNAL AND CHILD HEALTH NURSING. Class 7, Lab. 28, cert. units 12. (Eight weeks)

Practical application of acquired nursing skills with observation and understanding of nutritional concepts, social interactions, mental health concepts, and deviations of normal reproductive processes operative in the obstetrical patient.

74. PEDIATRIC NURSING. Class 7, Lab. 28, cert. units 12. (Four weeks)

Practical application of acquired preclinical nursing skills with observations and knowledge of nutritional concepts, social interactions, mental health concepts, and deviations of normal body processes operative in the ill child.

76. EXTENDED CARE. Class 8, Lab. 26, cert. units 13 (Four weeks)

Practical application of acquired preclinical nursing skills with observations and understandings of nutritional concepts, social interactions, mental health concepts, and deviations of normal body processes operative in the patient with a long-term illness.

UNDERGRADUATE LEVEL*

Lower-Division Courses

100. GUIDED READINGS IN NURSING. Class 1, cr. 1.

For nursing students and/or others with an interest related to nursing practice. Current literature and events related to nursing.

115. NURSING I. (Introduction to Nursing.) Class 4, Lab. 6, cr. 6.

Explores the concepts of health, illness, man's pursuit of wholeness, and nursing intervention through the use of the nursing process. Basic human needs, interpersonal relationships, and dynamics of behavior are studied. Laboratory experience is provided in the clinical setting.

116. NURSING II. (Medical-Surgical Nursing of Adults and Children.) Class 4, Lab. 6, cr. 6.

Applies the nursing process to the care of adults and children who experience problems related to selected basic human needs. Surgical intervention as a stress situation is studied. Laboratory experiences are provided in hospitals and other agencies.

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* All NT courses above NT 100 must be taken in sequence.

224. NURSING III. (Medical-Surgical Nursing of Adults and Children.) Class 5, Lab. 15, cr. 10.

Utilizes the nursing process in caring for adults and children who experience complex problems related to selected basic human needs. Laboratory experiences are provided in hospitals and other community agencies.

225. MATERNAL CHILD HEALTH NURSING. Class 3, Lab. 6, cr. 5.

Applies the nursing process in caring for the emerging family group throughout the maternal cycle and childhood. Includes the study of normal growth and development and the care of children with diseases unique to childhood. Laboratory experiences are provided in hospitals and other community agencies.

240. PSYCHIATRIC MENTAL HEALTH NURSING. Class 3, Lab. 6, cr. 5.

Integrates the pursuit of wholeness with a study of personality structure and common psychiatric disorders. Applies principles of individual and group behavior to the emotionally ill. Laboratory experiences are provided in hospitals and other community agencies.

280. ISSUES IN NURSING. Class 3, cr. 3.

Provides opportunity to acquire understandings essential for making an effective transition to the role of a registered nurse. Emphasis is placed upon contemporary problems and trends in health care.

290. GUIDED STUDY IN NURSING. Class 1-6, cr. 1-6.

Designed to provide core curriculum requirements in nursing for individual students enrolled in the baccalaureate program.

UNDERGRADUATE LEVEL
Upper-Division Courses

310. FAMILY AND COMMUNITY NURSING I. Class 3, Lab. 6, cr. 5. (Lab. hours arranged.) Prerequisite: Core nursing requirement or by consent of instructor; corequisites: COM 114, BCHM 100, BIOL 301, and PSY 340 or SOC 350.

Content and clinical experience emphasizing preventive health care with patients and/or families and promotion of community health. Focus on life style in providing health care plans using innovative nursing. Use of appropriate community resources and agencies.

320. FAMILY AND COMMUNITY NURSING II. Class 3, Lab. 6, cr. 5. (Lab. hours arranged.) Prerequisite: NT 310; corequisites: COM 320, BIOL 302, PSY 311, and EET 415.

Content and clinical experience with patients with illnesses which will significantly alter their life styles and that of their families. Accent will be on advanced clinical concepts in nursing stressing pathophysiological and psychosocial disturbances. Knowledge of community health will be utilized to provide for high-level wellness.

399. SPECIAL TOPICS. Class 0-4, Lab. 0-6, cr. 1-6.

Hours, credit, and subject matter to be arranged by staff. Course may be repeated for credit up to nine hours.

410. NURSING LEADERSHIP. Class 3, Lab. 6, cr. 5. (Lab. hours arranged.) Prerequisite: NT 320; corequisite: INDM 430.

Content and clinical experience utilizing leadership principles to implement care for and with groups of clients. Focus on leadership to coordinate interdisciplinary services, stressing group processes within a team. Emphasize evaluation of the milieu for its effect on delivery of health care.

420. NURSING MANAGEMENT. Class 3, Lab. 6, cr. 5. (Lab. hours arranged.) Prerequisite: NT 410; corequisites: PSY 500 and CPT 300.

Content and clinical experiences relate to the administrative component inherent in the managerial role of nursing. Skills are utilized to improve patient care management. Innovative patient care techniques are validated.

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